

# THE IRON AGE

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## War Plant of Erie Forge & Steel Co.

Tonnage Subordinated to Getting Out  
Forgings of High Quality—Details of  
Methods Employed and Equipment Used

BY SIDNEY G. KOON\*

**B**UILT as a war plant by the Navy Department, and operated by the Erie Forge Co., the new shops, under the name of the Erie Forge & Steel Co., have now been purchased by the company from the Navy Department. This is one of the plants developed and built under the emergency legislation of October, 1917, and the importance of its product was so strongly recognized by both the Navy Department (Bureau of Steam Engineering and Bureau of Ordnance) and the War Department (Ordnance office), that in both cases it was classed as a No. 1 plant and every effort made to expedite its completion and its entry into the ranks of delivering producers.

Material previously ordered for other places was in some cases commandeered, so that this plant should not suffer delay. A conspicuous instance of this was a 2000-ton hydraulic press originally ordered for the Norfolk Navy Yard. Another case involved four Westinghouse rotary converters which were already on the cars at Pittsburgh consigned to the new Pennsylvania Hotel in New York City, when they were stopped and diverted to Erie, where they have operated ever since. Structural steel had to be taken from other and earlier customers, and even gravel was obtained in the same commanding way.

Preliminary orders for the construction of the plant were issued Oct. 17, 1917. One month later, on Nov. 17, ground was first broken, and six months from that date, on May 16, 1918, the first open-hearth heat was poured from the first furnace. Before May had ended, the first shaft for the new fleet of Navy destroyers had been forged. The completion of this construction program, which kept 2000 men busy all winter, called for particular care in the placing of concrete and masonry work, because in one of the most severe winters of the past half century much of the work had to be done at temperatures below zero. Such precautions were taken, however, that not a single masonry or concrete failure has been reported.

This new plant has been built both with regard to

facility of intercommunication between units and with an eye to future expansion in either direction, west or east. The open-hearth building lies at the north end, with the forging shop immediately south of it, separated by a narrow court, the machine shop in three wide bays next to the forge shop and the heat treating department south of the machine shop. A standard gage shuttle track running north and south near the west end of these several departments is utilized for transferring material from one to another, and the arrangement is such that the material does not have to retrace its course in any part of its transport.

Two open-hearth furnaces, basic lined, and of nominally 60-ton capacity, have already been installed, while space has been reserved for a third furnace within the lines of the present building. These furnaces are frequently charged to 70 or 75 tons when it becomes necessary to make a particularly large ingot or forging. Ingots are poured in a deep pit, some of the molds being as much as 18 ft. high, including the hot top. The largest mold, with capacity for an ingot of 180,000 lb., is 64 in. inside diameter, 12 ft. 10 in. long,  $8\frac{3}{4}$  in. thick at top and  $16\frac{1}{2}$  in. at bottom, and weighs 140,000 lb. As is usual in forging plants, the molds produce octagonal ingots, or in some cases fluted ingots of a still larger number of sides.

Two hydraulic presses, of 2000 and 1500 tons capacity, built by the United Engineering & Foundry Co., Pittsburgh, and one 6-ton steam hammer, constitute the forging tools. This equipment supplements that at the old works, which includes two hydraulic presses of 1500 tons and 1000 tons capacity respectively, and seven steam hammers of varying sizes. The tonnage capacity of output at the new works is greater than at the old, however, in spite of the fact that only three forging units are available as compared with nine. This is explained on the score of the greater size of the units in the new plant.

In the forging department are four soaking pits designed and built by Alex. Laughlin & Co., Pittsburgh, each being 13 ft. 9 in. deep, with capacity of 50 tons. Two pits have openings 6 ft. by 10 ft. 6 in.; the other

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two, 6 ft. 10 in. by 10 ft. 6 in. Occasionally a piece comes in too long for the soaking pits, in which case it is handled in one of the regular heating furnaces.

There are eight of the latter, they being used for reheating pieces after the first forging and in some instances for completing the heating of ingots which have been preliminarily heated in soaking pits. All have regenerators, and were furnished by Arthur Stevens, Chicago. Four of these furnaces are 9 by 15 ft. each, with two doors 44 in. by 47 in. high. One is 8 ft. 3 in. by 12 ft., with two doors 36 in. by 38 in. high. The other three are 9 ft. 9 in. by 11 ft., each, with one door 30 in. by 50 in. high.

Great piles of dry sand in front of the heating furnaces are used for keeping hot the portions of long ingots which project outside the furnace doors. Two long preliminary annealing furnaces, 6 ft. by 50 ft., one being double ended, are located on the delivery side of the presses and are used in the case of some materials, before sending them to the machine shop for rough machining.

Practically all of the equipment in the machine shop consists of exceptionally massive tools, mainly lathes. Two of the lathes in particular are more than 100 ft. long, while a third is 88 ft. long. These are used for turning and boring shafting for large naval vessels, as well as forgings for naval guns of various sizes and for complete guns of 6-in. bore and smaller. Particularly interesting in the work of these long lathes is the process of trepanning, which will be described later.

In general, after a roughing cut has been taken in the machine shop, the pieces are carried into the heat treating room, where they are annealed, tempered or handled otherwise in accordance with the specifications under which they are being built. Very little carbonizing is being done in the plant, as it is rarely called for. Most materials are shipped out rough machined and without a finishing cut. In the case of crank shafts, however, of which large numbers are made for

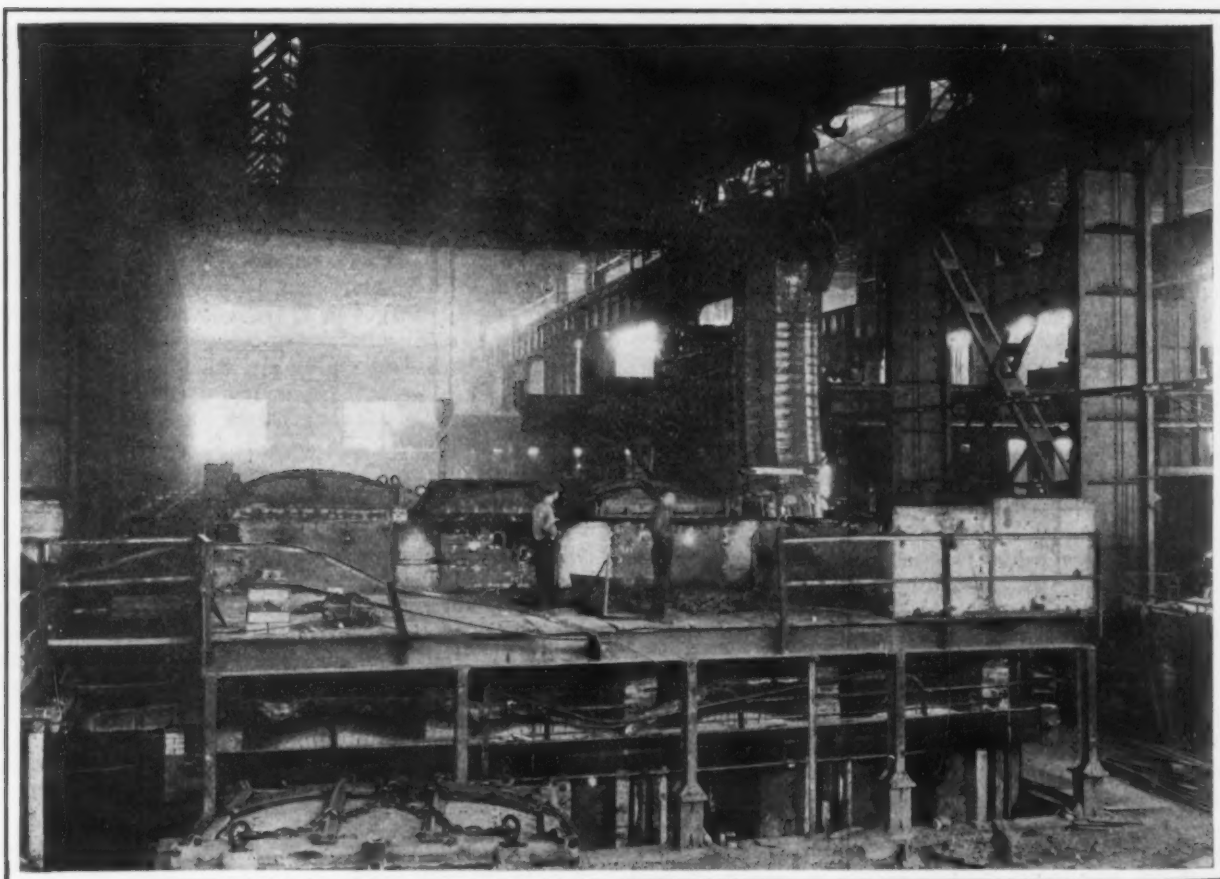
Diesel engine use, it is customary to finish the shaft complete in the machine shop, ready to be installed in the assembling of the engine.

In the heat treating department are six vertical furnaces all 8 ft. in diameter, five of them 29 ft. long, the other 35 ft. long. One large vertical quenching pit measures 12 ft. in diameter and 40 ft. deep. The equipment, of course, includes necessary grips for this purpose. In addition there are six horizontal annealing furnaces for shapes different from the long cylindrical shafts or gun forgings handled in the vertical furnaces. These six are all 6 ft. wide, with lengths up to 60 ft.

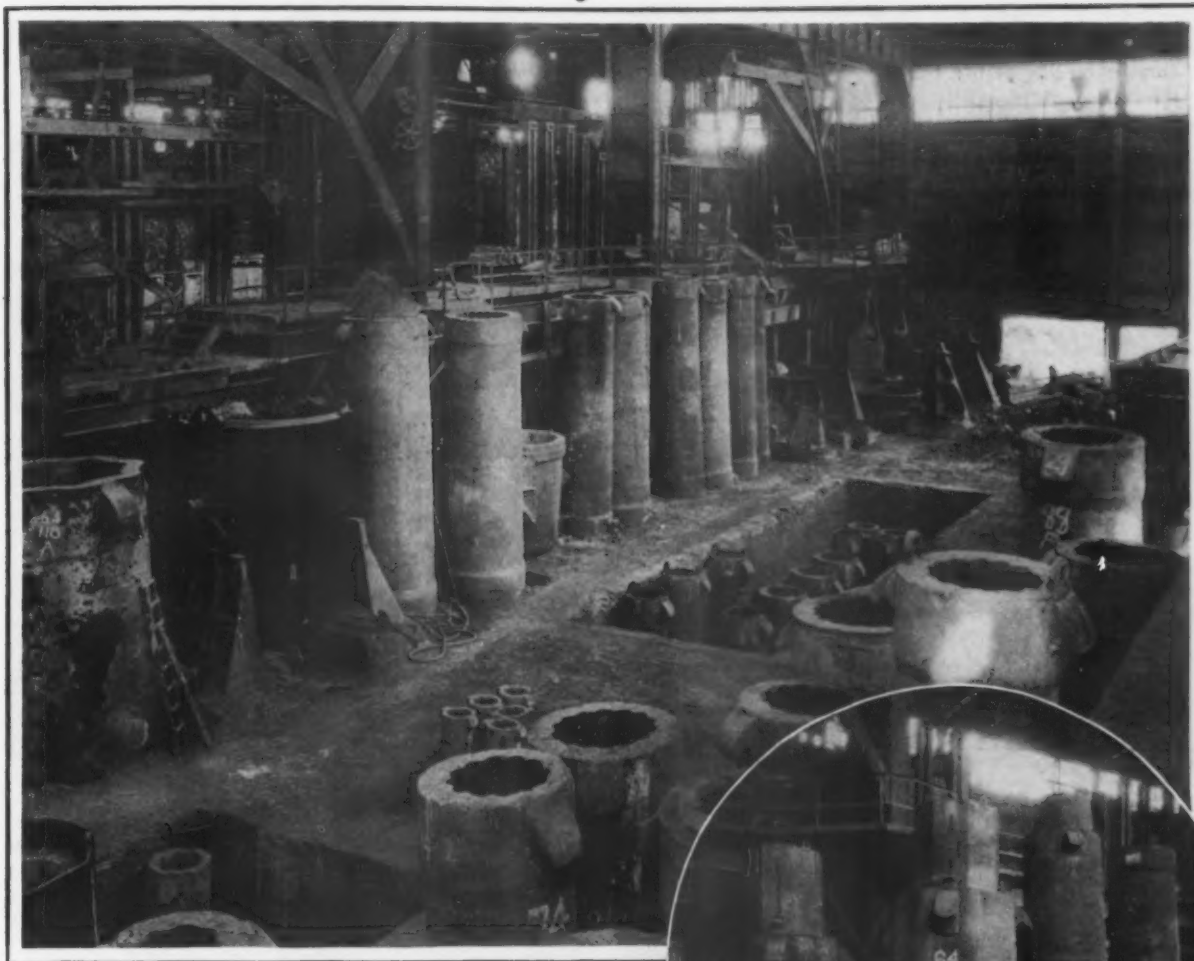
Control of temperatures in the heat treating department is assisted by the usual recording devices of Leeds & Northrup make. Material going through these furnaces follows the same carefully prearranged time and temperature schedule as elsewhere in the plant, and thus it is possible afterwards to trace the treatment each piece received.

### Open-Hearth Department

Recognizing, as all steel makers do—but how few act upon it—that the essence of superior quality lies in ample time of operation, the heats in the open-hearth furnaces take 12 or 13 hours from charging to tapping. The question of tonnage is held purely secondary to that of the quality upon which the firm's reputation has been built, and which is guarded with the utmost jealousy throughout all the manipulations of the plant. Orders will not be taken for anything which requires a slackening in the slightest degree of this quality program. Nothing is hurried, everything being run on a predetermined schedule, based upon the experience of years in the turning out of products of the highest quality. This program does not make for tonnage in the way in which that term is understood in the usual steel plant, for a furnace which takes 12 or more hours to do something which could be done satisfactorily for other purposes in 8 hours necessarily loses 30 or 35 per



Lowering a Heavy Ingot into Soaking Pit. In background, directly behind ingot, is the 2000-ton hydraulic forging press; beyond is the 1500-ton press. Reheating furnaces are along the wall at left



Steel from Stationary Open-Hearth Furnaces Is Poured into These Molds, the Longest Being 18 Ft. But the 12-ft. mold, 64 in. inside diameter, in the insert, has the greatest capacity of them all—180,000 lb.

cent of the tonnage which might be turned out under the other set of conditions.

The open-hearth plant itself is the outcome of bitter experience of years in attempting to get the quality of ingots for forging which continually tightening specifications were making necessary. So many of these ingots, purchased in the steel markets, forged down to approximate final dimensions, annealed and rough machined, had to be discarded because of defects shown up only after much money had been spent for material and labor, that finally the management decided that the only remedy was to install a steel-making plant where speed would be wholly secondary, and where the exact quality of product required could be obtained by the most unrelenting care in all of the details which influence that quality.

Nothing is left to chance. Even the scrap which goes into the making of the steel is selected with the utmost care. Rejection of carload after carload of scrap offered has taught the scrap dealers that the requirements of the company are particularly rigid, and that nothing which does not meet its requirements in every respect will be accepted. Naturally this scrap has to be low in sulphur because, without the facilities for getting rid of sulphur which an electric furnace affords, the amount of sulphur in the charge takes on an added importance. Oil fuel is used for melting the charge and making the heat.

When it becomes about time to tap a heat the melter is as frequently to be found in the adjoining laboratory as out on the charging floor, for the determination of carbon in the melted charge is carried on with chemical accuracy. The ordinary heat melts with about 0.80 per cent carbon—the nickel-steel heats at about 1.50

per cent—and under the continued action of the oxidizing flame from the fuel oil, this drops in carbon content with great regularity. When, in the melter's judgment, it has fallen to about 0.50 or 0.60 per cent, a test is taken out and the carbon determined in the laboratory. This takes about 15 minutes. As soon as this report is in, another test is taken out, and thus at intervals of 15 minutes or thereabouts successive test pieces are taken from the furnace, analyzed in the laboratory and recorded on the chart of each heat as it is worked.

A successive series of these carbon determinations would read about as follows: 0.56, 0.51, 0.47, 0.43, 0.39, 0.36, 0.32, 0.29 per cent. It is thus evident that, after the carbon gets down in the neighborhood of 0.40 per cent, it is dropping from three to four "points" every 15 minutes. The melter thus has an accurate gage from one determination to the next as to what the following one is going to show. As all heats are caught going down—no recarburizing whatever being done in the ladle, though the necessary ferro-manganese is placed in the furnace shortly before tapping—this method of checking is necessary in order that the heat may be made within the specifications. And all grades of carbon steel, up to 0.90 to 1.00 per cent carbon, are made this way, as well as tool steel and all alloys.

When the heat is almost ready for this carbon control, manganese determinations begin to be made at in-



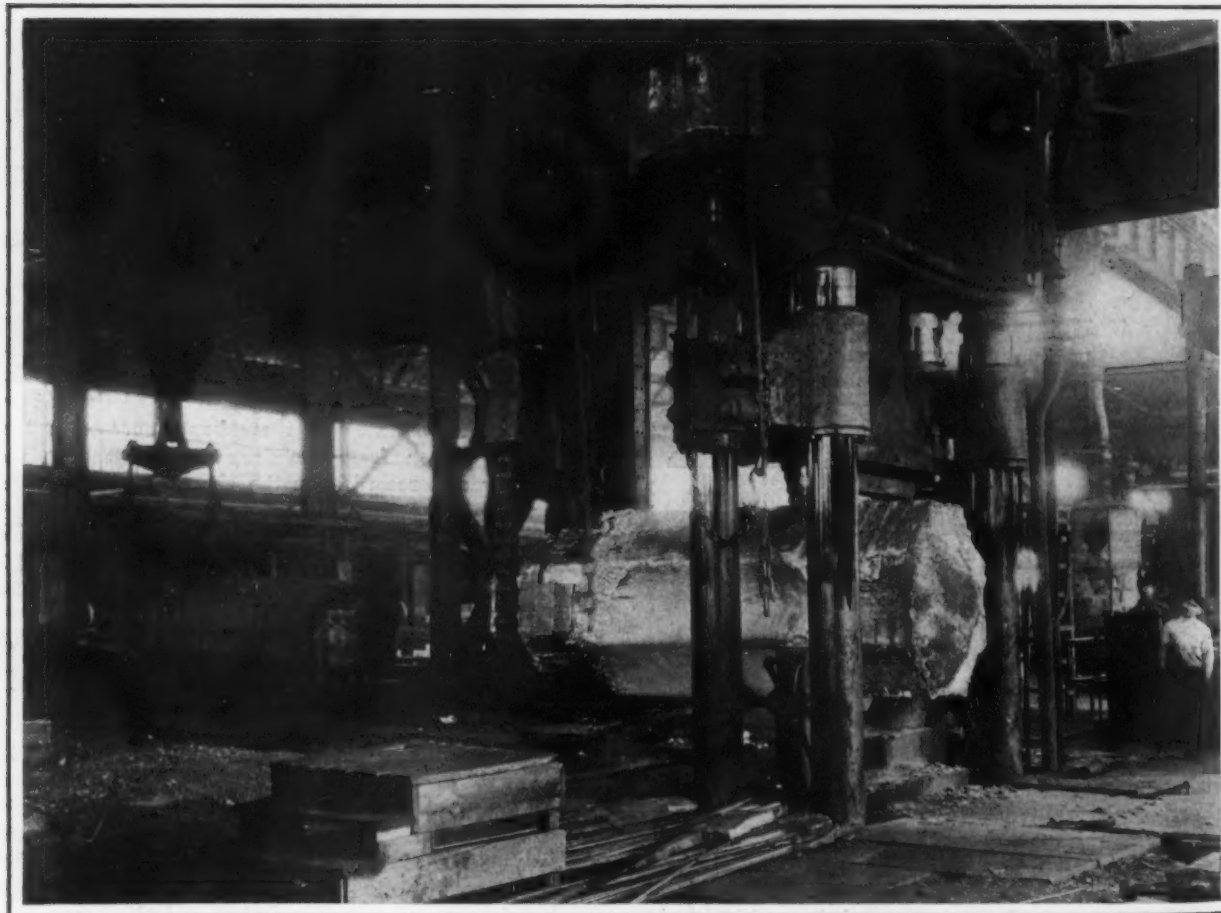


Battery of Eight Horizontal Reheating Furnaces Along the North Wall of the Forge Shop

tervals of 30 minutes, and the control of the manganese content of the finished steel is thus a matter of comparative ease. Nickel determinations in the many cases where nickel steel is to be produced are also made at 30-minute intervals, and any additional nickel required is put into the furnace in the form of solid pig nickel before the heat is tapped. In each such case

sufficient time is permitted for the homogeneous distribution throughout the bath of these various metalloids or alloys. The only things put into the ladle with the steel are a little ferrosilicon and aluminum, to quiet the heat.

The same care which has been used in making the steel is continued in pouring it, which is done through a



Eighty-Ton Ingot Under the 2000-Ton Hydraulic Forging Press. Ingot is turned by the chain supporting its porter bar (left) end, actuated from a pulpit as far away from the heat as was the camera. In the background at left are the reheating furnaces



1½-in. nozzle—the size varying somewhat with the character and temperature of the steel. An effort is made in practically all cases to pour the steel at between 2700 and 2750 deg. Fahr., the temperature being checked by an optical pyrometer. All ingots are top poured.

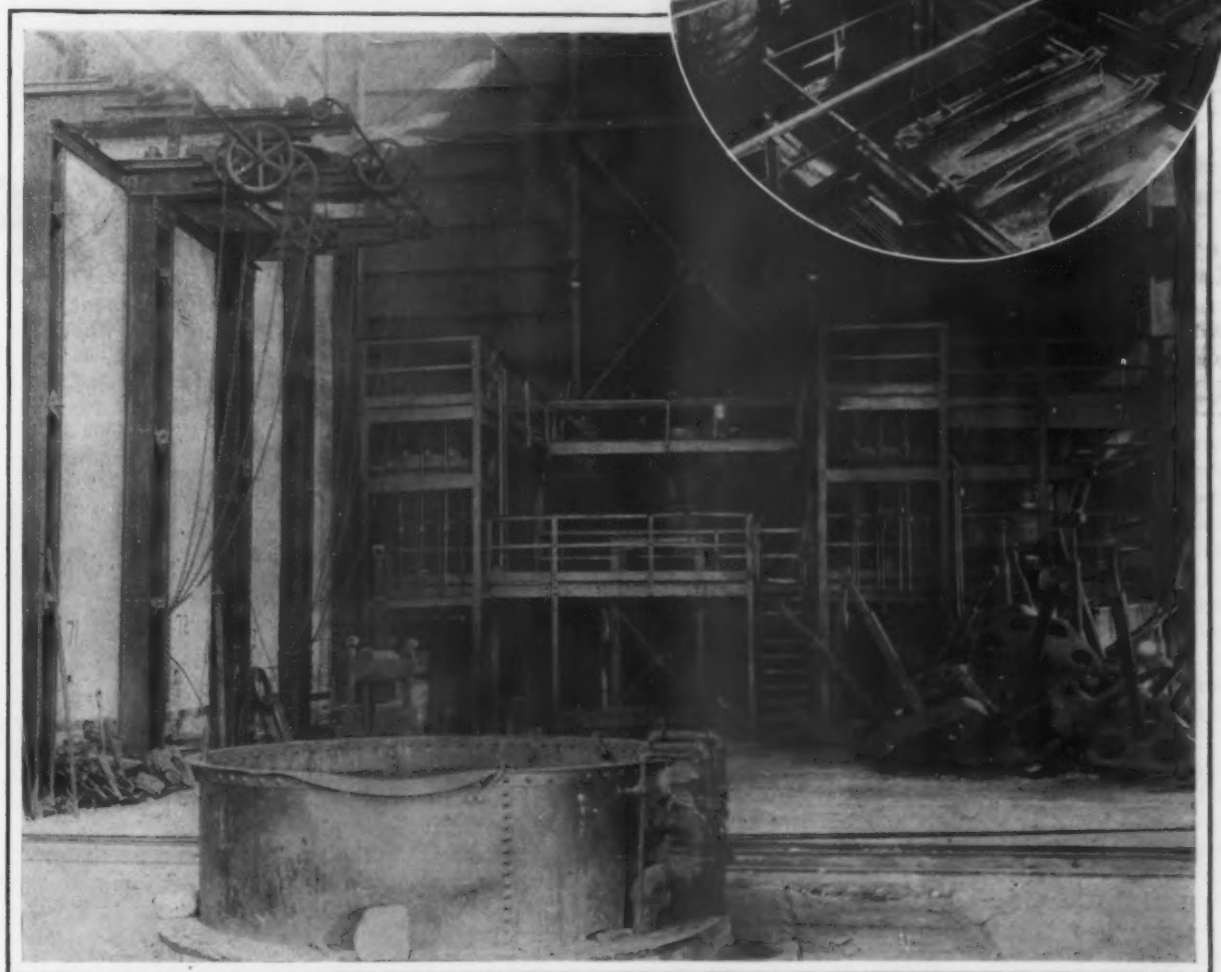
Newly-poured ingots are kept hot on top by means of a hot-top casting lined with refractory material. The riser of the ingot comes up into the hollow casting to a predetermined height, depending upon the placing of the refractory brick. Hence the hot top within the mold and upon the liquid ingot floats upon the metal and follows it down as it shrinks in solidifying. This avoids opening up a crack or spongy place immediately below the upper skin of the ingot and insures a sound top.

This hot top, which includes some 15 to 20 per cent of the ingot weight, constitutes the major portion of the discard under regular specifications. The total proportion cropped varies somewhat from one order to another, but in most of the Navy orders, with which the shop is well filled, the discard at the top is 25 per

duced an ingot of great uniformity in structure and reliability in working.

### Reheating and Forging Department

When the ingot reaches the oil-fired soaking pits in the forging department, it follows a definite prearranged schedule of heating in which the specific temperature which it is to have, hour by hour, is rigidly stipulated. As an example, an ingot is brought slowly to (say) 1400 deg. Fahr., and held there for several hours without change. It is then brought up in steps of



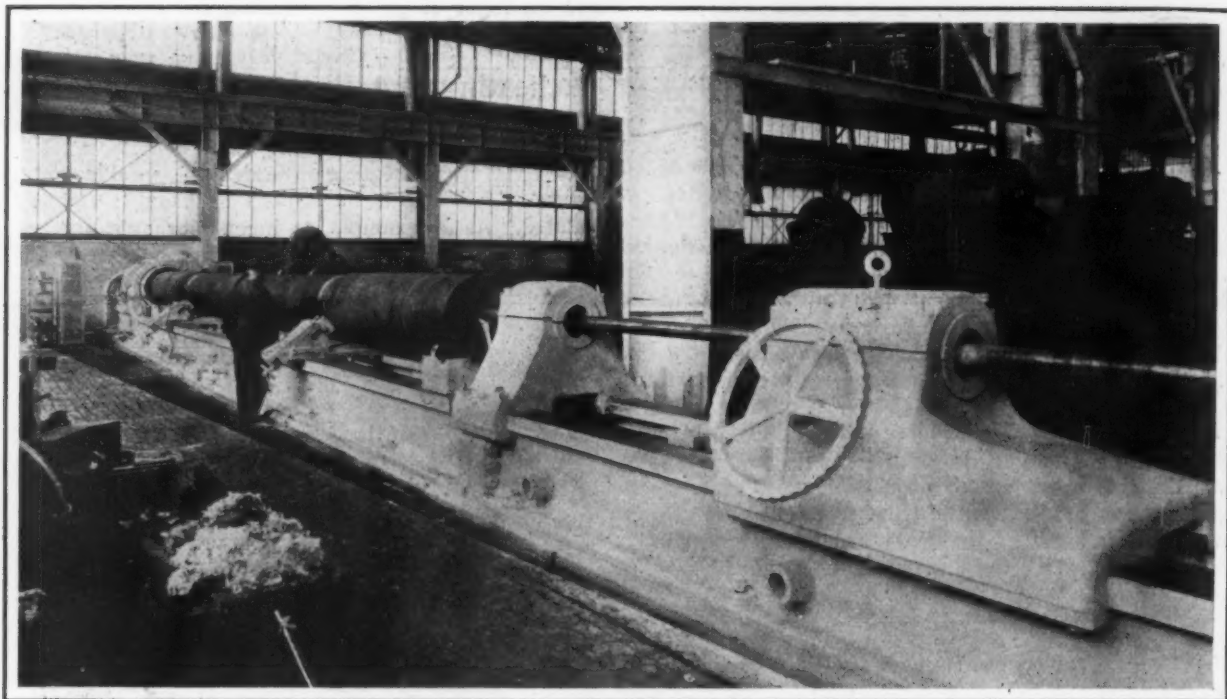
Vertical Furnaces and Quenching Pit in the Heat Treating Department Are Provided with the Necessary Appliances for Handling Work in Process

cent, with an additional 5 per cent at the bottom of the piece.

Ingots are stripped as early as the steel has thoroughly set, and placed in a large air-tight equalizing pit on the pouring floor of the open-hearth, where they are permitted to soak for several hours without the addition of any external heat, and thus attain a uniform temperature at about 1000 deg. Fahr.—well below the critical stage in the cooling curve. Entering this pit with the still molten interior perhaps 500 deg. hotter than the exterior, the gradual equalizing of the temperature avoids the contraction strains which might otherwise be set up near the surface, and thus is pro-

duced an ingot of great uniformity in structure and reliability in working.

Once every hour the temperatures at the top and the bottom of the standing ingot are read by the optical pyrometer—no thermo-couple having been found which would do this work satisfactorily. Record of all these readings hour by hour is placed upon the log accompanying each ingot in its progress through the pit. This forms a part of the permanent record of the works, by which it is always possible to trace, from the



Tool End of Big Boring Lathe Shown Opposite. Note stream of compound flowing from bore. The steady rests have only two points of contact

scrap which went into the open-hearth furnace to the finished piece as it left the shop on the railroad car, just what processes it went through; what temperatures it was subjected to and what the time-interval was from one part of the operation to the next.

Upon reaching the large forging press, which was commandeered from the Navy Department itself, the piece again finds a definite schedule of operations awaiting it. A blue-print furnished to the head-pressman shows exactly the amount of reduction to be made before each reheating, while general instructions tell him how much of a reduction is to be made at each impression of the press before the piece is turned around and squeezed in the other directions. Observance of these general directions avoids the trouble so often experienced, of opening up the center of the ingot into a four-pointed star-shaped fissure. The reduction is so gradual and the piece rotated so frequently that it is impossible for the fibers to tear themselves apart in the way which accompanies less careful forging.

All of the large ingots handled on these two large presses are carried in the usual rotating chain slings by two cranes, one on either side of the press. The sink head which has later to be discarded is used as a porter bar. The operators of the two cranes stand side by side in a fixed pulpit, far enough away to avoid the worst of the heat, but in plain sight of their work. Here they may talk to each other, and thus control their respective cranes in unison far better than would be possible if each were mounted in a cab upon his own crane.

For handling smaller ingots, a 50-ton Alliance Machine Co. manipulator, similar in design and operation to the charging machines of the floor type commonly used in open-hearth practice, has been installed at the 2000-ton press. A similar 35-ton manipulator serves the 1500-ton press. These machines grip the piece by the sink head and handle it under the press with the greatest facility, advancing and retreating, turning the piece over and otherwise manipulating it more quickly than could be done by the cranes.

To keep the forging gang busy during the time of transporting materials from the heating furnaces to the presses and from the presses to the annealing furnace or elsewhere, one forging gang only is used. These men have nothing to do except to forge the pieces.

They do not handle them either into or out of the press department, and hence are shifted from one press to the other as required by the work. This effects a considerable saving in cost, because by this means high priced men are kept almost continually busy at high grade work, and are not required to do any of the work of laborers.

#### Much Navy Work in the Plant

During the war this plant was in operation night and day on Navy guns of 3-in., 4-in., 5-in. and 6-in. sizes, on crank shafts and other shafting, for destroyers, submarines and battleships, and on certain special work such as gun hoops for 12-in. replacement guns for the Navy. All of this work was alloy steel, the gun forgings being of nickel steel with about 2½ per cent nickel. For other forgings a still higher percentage of nickel was used, running up to 3½ per cent, and in some cases both chrome and vanadium were employed. At this time two bays of the machine shop were used for shafts and miscellaneous work and one bay for guns. For the latter there were 13 large lathes in use, the rough-turned parts being shipped to Washington, Watervliet, Watertown and various other arsenals and works, for finish machining and assembling. These lathes are now out in the yard awaiting a purchaser.

Rapid expansion raised the force of 400 men in the plant to a total of 4000, of whom the great bulk were virtually untrained in this exacting class of work. Only a few of the experienced men were lost to the draft, however, because, being a Class 1 plant under both Navy and Army schedules, the company received the highest consideration with regard to the retention of skilled men in work which was urgently necessary. This prevented that disruption of the force which proved so harmful in many other industries.

Navy orders still predominate in the plant work, which includes principally gun forgings and shafting. An experimental lot of 6-in. Navy guns, 53 calibers long and forged in one solid piece of nickel steel, instead of being built up from tubes, jackets and hoops, has recently been shipped. These "monoblock" guns are 28 ft. long, 26 in. in diameter at the breech and 13 in. at the muzzle. Orders are in the plant for all the nickel steel shafting for five of the six battle cruisers now under construction, four of the six super-dreadnoughts and seven of the ten scout cruisers.

Especially interesting are the battle cruiser shafts, because of their size and the great amount of power which is to be transmitted through them, and also because of the methods adopted in manufacture, due to the special requirements of the finished piece. Each shaft will transmit upward of 45,000 hp. under full load, which is far greater than the total power of all the machinery on any warship now in service in the United States Navy. Each ship has four such shafts, each composed of three sections—the propeller shaft, the stern tube shaft and the thrust shaft. These vary in length from 30 to 50 ft., and differ in their outlines, due to the particular service which each has to render. These shafts are forged from 64-in. ingots, 18 ft. long plus the hot top, and weighing 83 tons.

In some respects the stern tube shaft is the most interesting of the three, because of the fact that both ends are bored to much smaller inner diameter than the middle section. After the shaft has been forged to approximate final diameter (23½ in.) throughout the entire central portion, with a much larger diameter remaining at each end, and the central section rough turned, a hole 13¾ in. in diameter is trepanned through the entire length of 39 ft. or more. This results in cutting out an 11-in. diameter core, as about 1 in. of metal is cut away in an annular ring.

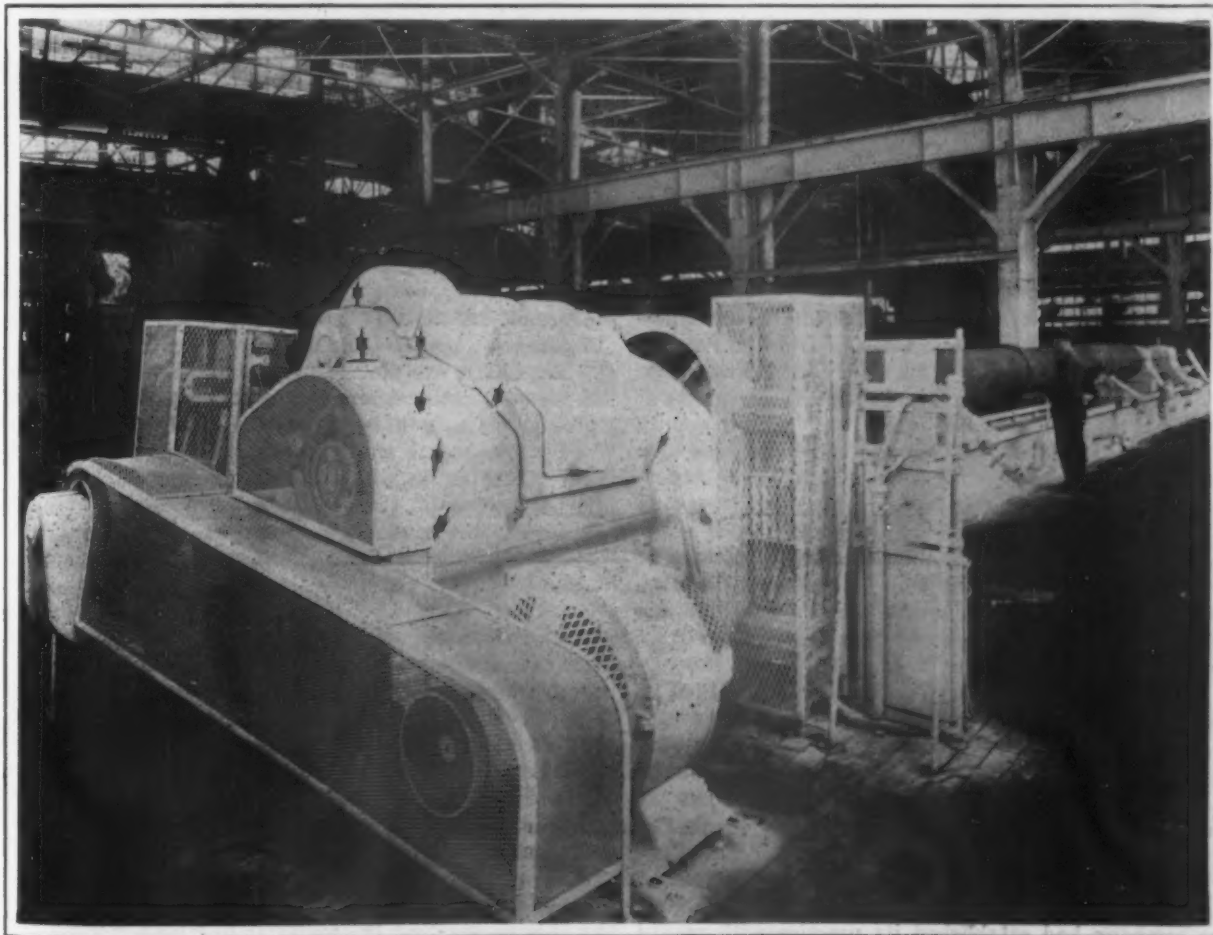
Mounted on one of the long lathes already mentioned, the trepanning device does this cutting at about 14 in. per hour, the boring tool turning clockwise as viewed from the boring tool end, and the shaft turning at about the same speed counter-clockwise. The boring is literally flooded with lubricating compound at 100 to 125 lb. per sq. in. This is forced through pipes by means of four pumps located in a separate pump house, and taking their suction from a sump to which all of the used compound drains from the various lathes.

After the shaft has thus been bored, it is taken back to the forge department and one end, placed in a heat-

ing furnace, is again gradually brought up to forging temperature. Then the thick diameter is forged down in three heats to the same diameter as the center, which is to become the uniform diameter of the entire shaft. This results in closing the hole already bored, to about the size of a broomstick. But as the forging is carried on in very gradual steps, and the piece continually rotated during its progress, this hole left in the center is approximately circular in cross section, instead of being irregular and elongated, as would be the case if the material were punished by the all-too-common method of forging in large drafts. Then the other end is treated the same way. Again placed in the machine shop, the end sections are bored to their final inside diameter of 4 in. or 5 in., as the case may be.

As this forging is made from an ingot of 60 to 80 or more tons, its weight is depended upon to keep it in place upon the trepanning machine. The shaft has first been rough-turned on the outside to within ¾ in. of finished size, so that the coincidence of the axial location of the trepanning tool with the axis of the piece may be determined with great accuracy. The piece itself is rotated by a motor at the tail end of the machine, while two or more sets of idler rollers located along its length support its weight and keep it in position. Of course these rollers have to be set with the utmost precision before beginning work. No top rollers are used, consequently the piece is not subject to the constraint of their pressure, and this is one of the secrets of the relatively low consumption of power in the operation.

Savings from this trepanning operation take several forms. In the first place there is reclaimed a large billet or shaft 11 in. in diameter, made of nickel steel, which can either be used for other orders in the shop or can be sold at the high prices which alloy steels command, in place of the scrap price of perhaps \$10 per ton which would have been obtained had the boring



Drive End of Boring and Trepanning Lathe, 48 In. by 84 Ft., with All Gearing Fully Protected by Screens



been made in the usual way, leaving nothing but chips. In the second place it is estimated that boring in this manner can be done in one-third the time which would be required for the boring out of the solid material into the form of chips. In the third place the power requirements for boring in this form are only about one-third as great as for boring out by the usual means.

Particularly important, however, is the use of material of the utmost homogeneity for the hollow cylinder used for carrying the trepanning tools. In places where this method has been attempted without success, failure was due to the fact that this feature did not receive the consideration it deserved, with the result that the thin, hollow tube, which carries the cutting tools and into which the core is received, could not be kept from buckling, due to the resistance of the work. Needless to say, the same homogeneous quality of material is necessary also in the piece subjected to this treatment.

with certainty of result, a successful attempt was made to get the whole of the business of some of the largest Diesel engine manufacturers in this country, instead of only dribblings. As this phase of the situation was reached only a few months before the beginning of the big war, it became possible for the engine builders to get their shafts without interruption, even when imports from Germany were absolutely cut off. As a result of this sequence of affairs, it is reported that about 90 per cent of all the crank shafts in the American submarines have come from this company.

Specifications for the eight-throw crank shafts called for a tensile strength of 105,000 lb. per sq. in. on a transverse test piece, with an elastic limit of 80,000 lb., an elongation in a 2-in. specimen of 22 per cent and a reduction of area of 50 per cent, and the test piece is cut from near the ingot heart. These figures have been consistently exceeded by about 10 per cent.



North Bay of the Machine Shop, Showing Heavy Navy Shafting in Various Stages of Finishing. Cold saw in foreground

Another interesting shaft under construction at Erie is an eight-throw crank shaft for submarine use, patterned after a shaft of similar design found in the captured German submarine U-54. The well known severity of crank shaft service for Diesel engines makes it necessary to provide shafts of the very highest quality of steel obtainable. A side light on this is afforded by a situation existing prior to August, 1914, when American makers of Diesel engines, almost without exception, refused even to experiment with American-made crank shafts. This, of course, followed a costly history of breakages and excuses, so that practically all of the Diesel engine shafts used in this country were, for this reason, obtained from Germany, and most of them from the Krupp plant in Essen.

Not until the Erie Forge Company had installed its own open-hearth department, and therefore had control of its own raw steel, did the company make a serious bid for this business. Even then, it is reported, more than a year was consumed in efforts to get the business before the first trial order was placed, and for more than a year after that only an occasional order was allotted to the company, the great bulk of the material still coming from Germany. When, however, the company had established its practice with regard to these shafts on such a basis that they could be made

The maximum results obtained were: 132,000 lb. per sq. in. tensile strength, 100,500 lb. per sq. in. elastic limit, 27 per cent elongation and 65 per cent reduction of area.

The shafts are made from a 48-in. ingot, only about 25 per cent of the weight of which is represented in the finished piece as it leaves the shop. Inasmuch, however, as the crank shaft represents from 25 to 33 per cent of the entire cost of the complete Diesel engine, the importance of care in its manufacture is at once apparent. Six of the eight cranks are for the six main cylinders, one for pump and one for compressor.

#### Physical Laboratory and Its Tests

Particular attention is paid in the plant to the subject of metallography. A photo-micrographic apparatus is employed in which all the important heats are studied, both photographically and through the eye piece. As the Navy Department has prepared definite specifications along these lines for a good deal of its work, the use of the photo-micrographs becomes important in keeping to the specifications. This method has been followed still further, however, in analysis of material from other sources which has failed to give satisfaction in use. In some cases it has been possible to show by this means that the material had been worked too cold for its own good, and thus strained locally. This

was due in part, no doubt, to an effort to finish forgings with a smaller number of intermediate heatings than they should have received.

To teach the operating force something of the relationship which exists between quality of steel on the one hand, and the two elements of temperature and time of treatment on the other, a set of photomicrographs has been prepared, taken from forging samples subjected to various kinds of treatment. The crystal-line structure of the steel tells eloquently of the stresses to which it is subjected when wrongly treated, and forms an object lesson which has taught the men of the heat treating department a good deal of the why and wherefore of the strict orders under which they operate. The uniformity of crystals in the product turned out is partly the result of this method of education.

Other tests carried on in this physical laboratory include the study of the behavior of material under repeated reversal of stress. This is done in the usual manner, with a piece of small shaft turned down to perhaps  $\frac{1}{4}$  in. diameter, weighted in the middle to a point only slightly below its elastic limit, and then rotated at 1000 to 1200 r.p.m. for several weeks without stopping. The piece on the machine was loaded to a fiber stress of 38,000 lb. on the sq. in.—a far higher figure than any material receives normally in service—and had already made approximately 99,000,000 revolutions without apparent distress.

Equipment items in this laboratory include an oil-fired heat treating furnace, four small electric furnaces for tempering, etc., an oil quenching tank and various calibration devices. For potentiometer work a brick pier is carried up from its concrete foundation, quite independent of the floor and hence of its vibration.

A test piece of ordinary carbon steel, shown in the illustration, and which broke with a beautiful cup fracture, gave an elastic limit of 61,000 lb. per sq. in. and an ultimate strength of 91,500 lb. per sq. in. The elongation in 2-in. was 28 per cent and the reduction of area at the fracture was 63½ per cent. This was a piece cut transversely across the ingot from which it was taken; the steel had the following chemical composition: Carbon, 0.46 per cent; manganese, 0.52 per cent; phosphorus, 0.016 per cent; sulphur, 0.026 per cent; silicon, 0.188 per cent.

In common with other live organizations of the same character, the Erie Forge & Steel Co. does a great deal of work for itself, such as most manufacturers have done outside. Thus, the electric repair gang not only handles the ordinary line repairs, etc., but does all the repair work on all the motors in the place, even to winding armatures and field coils.

An interesting instance of this effort to make the place self-contained so far as possible lies in the laminated-type plate link chains used in the forging shop for handling and rotating ingots during the process of forging. Two of these chains are used for each press, and they were formerly purchased at about \$450 per chain, a price which, under the stimulus of the war, soon doubled. These chains had a life of from three weeks to one month, with the former predominating. As the expense was rapidly going beyond reasonable bounds, particularly with the rush of work coming into the shop, which was frequently delayed to put in a new chain, an effort was made to form these links of a tough alloy steel which would stand up better under the severe service and heat to which they were subjected. Consequently forgings of chrome vanadium steel were made and the links stamped out to size. The first chain thus made has already been in use for two years and appears to have a long life ahead of it.

Stores are handled on the very rational basis of ordering anew at a definite point in the consumption curve. There is a physical separation in each bin in the storeroom, below which are just enough stores of

each particular character to last during the period which it will take to get delivery on a new order. As soon as this point is reached, the store-keeper orders the amount of these stores which experience has shown will last for a reasonable period and at the same time can be purchased at reasonable quantity prices. The storeroom clerk, who keeps a perpetual inventory of all stores, is in position to check up constantly on these orders, and if an order does not come through within a day or so after stores have been brought down, according to his records, to the danger point, he immediately investigates. This system makes it unnecessary to tie up an undue amount of capital in the storeroom, while at the same time it permits the storekeeper to obtain materials on the best price basis available. The great



Cup Fracture on Tensile Test of 0.46 Per Cent Carbon Steel Which Showed 91,500 Lb. per Sq. In. and 61,000 Elastic Limit

diversity in the stores carried, however, calls for a constant supply valued at approximately \$150,000.

All trackage throughout the plant is of standard gage, thus permitting the shifting of railroad cars to any point where they may be needed. Electric storage battery locomotives are used in transporting material from one place to another, including the hauling of stock charging cars from the open-hearth stock yard onto the charging floor, and the hauling of materials between the open-hearth department, forge department, machine shop and the heat treating building.

Because of the moderate depth at which surface water was encountered in the excavations for the building and machinery foundations, a large drainage system has been put in, entirely surrounding the plant at a depth of some 27 ft. below the ground. This drains out the surface water and keeps it away from the open-hearth casting pit, the regenerators in both the open-hearth and the furnace buildings, and from other places where it would cause damage.

Oil fuel storage is provided in six tanks, two of which have 400,000 gallons capacity each, while the other four contain 50,000 gallons each. This total of 1,000,000 gallons capacity is sufficient to last about 50 days when the plant is operating in full. Fuel oil is pumped into the tanks direct from oil tank cars delivered alongside. From the tanks it is pumped at definite pressure to the various points of use.

Forging procedure at the plant has been developed largely in the plant by the forge-shop superintendent. The general layout and construction, as well as operation of all the departments and their correlation to each other, are due to the energy of G. W. J. Stout, general superintendent. But dominating each and every activity is the genius of the president and founder, R. F. Devine. All these men have practical knowledge of forging problems, from the blacksmith's forge to the 80-ton ingot; and the men under their charge, taught quality and loyalty at every turn, have had no small share in the growth of the firm's reputation.



## ELECTRIC STEEL IN ALASKA

### Making Iron or Steel Castings Where Coke Is Scarce and High

The following extract from an article by W. E. Cahill, in *Mining and Scientific Press*, entitled "Electric Furnace Practice at Treadwell," affords an illuminating survey of the possibilities of such a furnace in an unusual locality such as far-off Alaska:

"We are one of the pioneers in the manufacture of iron castings by means of the electric furnace; in fact, it is only practised in the East for castings that require a superior quality of metal. With coke at \$50 per ton delivered and pig iron at a correspondingly high price, the cost of producing iron in the electric furnace is less than by melting it in the cupola with coke. In cupola melting, the iron, as it melts in passing through the bed of hot coke, picks up sulphur. The action of the blast oxidizes some of the silicon, and introduces gases into the metal. These reactions tend to make the iron hard. This is offset by the addition of pig iron to dilute the sulphur and to replenish the silicon by the excess it contains.

"In the electric furnace the action is different. In the first place the iron is melted under a neutral or reducing atmosphere. The metal is refined under a calcium-carbide slag, which removes the sulphur even to the limits of that found in steel, whereas the silicon is not appreciably reduced. No pig iron is required, as the metal is softer and stronger than that of the original charge. The chemical composition of the iron is under control; if it be found desirable to raise the silicon or manganese content, this can be done by introducing the ferroalloy directly into the bath of molten metal. The temperature of the iron is under the direct control of the operator. Dull iron is a thing forgotten. There is no rush to keep the iron away from the cupola. The whole charge can be taken at one tap or any desired amount at intervals. Little hearth repairing is necessary after an iron heat, from 20 to 50 lb. of magnesite being sufficient for the purpose. In making white iron castings the high temperature attainable makes it possible to pour very thin sections. At times it is necessary to convert part of the remaining charge of gray iron into white iron; this can readily be done by the addition of ore. The shrinkage of electric furnace iron is less than that of cupola iron; aside from the merit of purity, its superiority is due in a large measure to the absence of occluded gases.

"Insulation is common when starting the furnace on heavy scrap-iron. It often happens that the three electrodes will rest on top of the charge and no current passes through. A good remedy is to add a few shovelfuls of clean turnings. In extreme cases one can always shovel in some coke, bringing the current over the top of the charge until a steady arc results.

"Iron castings are made about three or four times per week, the usual practice being to pour in the morning. Every afternoon we take off a heat of steel—high carbon, low carbon or alloy, depending upon the requirements. The melting of cold steel scrap in a cold furnace gave us considerable trouble at first. The melting starts at the top of the pile directly under the electrodes. The electrodes gradually work their way toward the bottom. As the steel melts it drops down and strikes the cold magnesite hearth and freezes. The electrodes continue their downward path until a pool of molten steel is formed and the melting of the scrap raises the level of the bath. The course is then upward until all the scrap is added. The layer of solid steel on the bottom cannot be melted by keeping the heat on the bath and without overheating or injuring the furnace.

The trouble seems to be due to lack of circulation, the hot metal being on the top. This circulation can be insured by the addition of iron ore, which causes the metal to boil, and so washes out the layer of frozen metal. Hematite has proved most satisfactory for this purpose as its action is quick and the effect on the slag is slight. Frequent testing of the bottom with a steel bar is necessary; for, after the steel is free, continued boiling will wash out magnesite, causing slag troubles.

This condition is common when using heavy scrap. When proper scrap is available, the density of the charge may be so arranged that the electrodes will penetrate near to and will heat the bottom. Great care must be used when the scrap is light, especially if the electrodes are penciled, for the pool of steel formed might not be of sufficient depth to prevent the electrodes from boring into the bottom. It is advisable to know the length of the electrode (that is, the distance from the holder to the furnace bottom), so that if the position becomes dangerous, the current may be reduced until it starts to rise.

"Several months ago we had a heat of steel nearly ready to pour, but the power went off and the charge froze in the furnace. A break in the line kept the current off until the next day. By chipping away the slag from under the electrodes we were able to start the circuit. After having the current on the solid chunk for two and a half hours the maximum depth of the pool of molten steel was about 3 in. The furnace was getting very hot so we started feeding ore. When the carbon content became low, pig iron was added. By alternate additions of ore and pig, the steel was finished, and the furnace was poured clean within five hours from the start.

"The charging of the furnace influences the melting. Gates and risers make a good charge for the bottom, giving the proper density; and, being at the bottom, the coating of sand does not interfere with the electric conductivity when starting operations. Light scrap is placed on the top and may be piled a foot or more above the doors. A small piece of coke is placed on top of the scrap directly under each electrode. The coke makes a better contact, acts as a cushion, and prevents violent surges of current when starting. The former practice of using hand-control for starting has been discontinued, and automatic control is now used. Peak loads seldom exceed 850 kw., whereas the working load is between 500 and 600 kw. After a steady arc is formed, usually about five minutes after starting lime is shoveled around the electrodes to form the basic slag. Later, as the charge melts, more lime is added. If the scrap melts so as to expose part of the roof to the glare and reflected heat of the arc, it is well to work over some of the light top scrap with a bar, so as to shade the arc and prevent unequal heating of the roof."

[The furnace referred to is a 2-ton Heroult at the plant of the Alaska-Treadwell Gold Mining Co., Treadwell, Alaska.]

### Aluminum Pistons for Petrol Engines

Data on some experiments on aluminum pistons for petrol engines have been published by W. Von Selve in the *Zeitschrift des Vereines deutscher Ingenieure* for June 12, 1920. An abstract furnished by *Technical Review*, London, is as follows:

These tests show the advantages of aluminum as compared with cast iron for pistons, owing to their lower specific gravity, better thermal conductivity, better frictional conditions and their insensitiveness to the effects of air, water, oil and acids. The comparison extends to aircraft engine pistons made by different processes, the piston diameter in each case being 140 mm.

	Cast Iron	Aluminum Sand-cast	Pressed Aluminum	Aluminum Chill-cast
Weight of unmachined piston in kg. ....	6-7	3-3.5	8.0	3.0
Weight of foundry discard, kg. ....	3.0	1.0	1.5	0.75
Faulty castings, per cwt. ....	10	20	20	5.10
Total metal required, kg. ....	5	5	10	4
Weight of turnings in machinery, kg. ....	..	0.75	6	0.75
Strength of finished piston, kg. per sq. mm. ....	18-19	18-20	33-36	20-25
Strength after 10 hours running, kg. per sq. mm. ....	18	15-17	26-31	18-19
Elongation at rupture per cwt. ....	..	1	1.5	1-1.5
Ratio of approximate price of machined pistons ....	1	3	6.5	2

The comparison shows that chill-cast aluminum pistons, which satisfy all requirements, are economically the most advantageous, as the increasing demand for them demonstrates.



## EFFICIENT JOURNAL BEARINGS\*

### Ball and Roller Bearings Compared—Both Superior to Plain Bearings

Increased production follows the use of ball and roller bearings correctly designed and accurately made, whether they be used in transmissions, machine tools, motors, rolling mill or other machinery, or wherever heavy work, continuous operation or precision of manufacture is encountered. Some tests have shown as much as 50 per cent power saving over plain bearings in large factories, but this is exceptional; ordinarily, 15 to 25 per cent is more nearly correct. But the saving, even in small plants, is very appreciable, and is a big help in reducing the overhead.

Not only is there a saving in power but, using bearings particularly adapted to the machines, almost continuous operation is insured, and the annoyance of shut downs to reline, adjust or replace plain bearings is avoided. This alone more than compensates for any increase in first cost of application of the anti-friction bearings.

#### Workmen and Lubrication

As workmen will not give proper attention to the correct lubrication of plain bearings, great friction develops, the bearings burn and wear out quickly, and generally require renewal at just the time when the mill is busy and wishes to keep machinery operating continuously. Many factories make their repairs over the week end, but this is expensive, and pay of time-and-a-half for Sunday work makes overhead climb. A properly designed ball or roller bearing, packed with the correct lubricant and properly inclosed, will operate at least fifty times longer than a plain bronze or bab-bitted bearing under the same conditions. This makes a big saving, too, in the quantity of lubricant used.

Notice the "properly inclosed" above. Oftentimes too little attention is given to the mounting and inclosing of bearings; but they can be so inclosed as to maintain the lubricant for an almost indefinite time, also preventing oil from leaking or dripping onto the floor or onto material being manufactured.

Makers of ball and roller bearings specify the lubricant which will give the best results. Graphite and other pulverized minerals should be avoided, as well as greases or oils containing acid or alkali. Pure vaseline, thinned with a pure mineral oil to the consistency of cream, makes the best lubricant.

With properly designed ball or roller bearings no adjustment is required. They should outlast other parts of the machine, and be made "fool-proof"—impossible of adjustment. And the load-carrying capacity and speed of operation of ball and roller bearings exceeds that of plain, bronze or bab-bitted bearings. Economy in space can often be achieved by replacing plain bearings with ball or roller bearings.

#### Differential Between Ball and Roller Bearings

In a sense the ball and the roller bearing each has its own particular field. Yet a correctly designed roller bearing is generally superior to a ball bearing for load-carrying purposes. Because of inherent features of design, a ball bearing is usually best suited to carry relatively light loads at high speeds of rotation. A roller bearing, on the other hand, is superior to the ball bearing for carrying large loads at moderate speeds, and will more successfully carry heavy shock loads.

Given a ball of certain diameter, and a roller of the same diameter with its length equal to the diameter, the roller will, for a given load, have a greater surface contact with its raceway than will the ball. The direct compressive stress over this area of contact will therefore be smaller for the roller than for the ball. Assuming a maximum safe working stress, the roller will safely carry a greater load than the ball at all speeds of rotation, since the drop in capacity at different speeds, due to fatigue stresses, is approximately the same for each. Size for size, made of the same mate-

rial, and operating at the same speed, the roller bearing will, for a stated safe working stress, carry approximately 50 per cent greater load than the ball bearing. On the basis of dollars per pound capacity, therefore, it is evident that a roller bearing is a more economical installation than a ball bearing.

As the ball makes contact with its raceway under load, a certain area at the top of the ball and a certain area at the bottom, differing slightly in magnitude, will be in direct compression. The form of this surface contact area will be a warped ellipse. As a result, instead of having point contact at top and bottom of ball, surface contact occurs, and a series of points on each side of the highest point of the ball will be touching the raceway. Since the ball should theoretically rotate about its own axis, and since the speed of rotation of a point on the periphery of the ball varies as the distance from an axis through the center of the ball, it follows that for any load applied to the bearing there will be a certain amount of slippage. As the load on the ball is increased, the contact area becomes greater, thus increasing the slipping tendency.

This results in a sliding effect on the raceway which slowly but surely grinds it away. Ball bearings are thus limited in load carrying capacity for practical reasons, as well as the foregoing theoretical considerations. Slippage is not met with in correctly designed roller bearings. All points on the periphery of the roll necessarily have the same velocity at any stated speed of rotation of the bearing.

#### Radial and Thrust Loads Should Be Separated

A great many ball bearings are designed to carry both radial and thrust loads simultaneously, by employing angular contact between balls and races. Since it is a practical impossibility so to design a ball bearing that the velocity of each point of contact will be the same, an additional spinning action is introduced. This tendency, together with the slippage resulting inherently from contact between balls and races, causes two different, distinct spinning effects on the raceway.

For any appreciable radial and thrust load, the wear and tear on the raceways is of serious import. A bearing should be designed for the performance of one function at a time. As one manufacturer of high grade ball bearings states in his catalog: "radial and thrust load cannot be carried ideally in one bearing simultaneously. Where combined radial and thrust loads must be carried, combination bearings (one radial and one thrust) assure maximum efficiency and durability."

In any ball or roller bearing, it is desired to obtain true rolling action—revolution of balls or rollers around their axes in parallel planes. This means freedom from slippage and skewing and elimination of wear. A properly designed and accurately manufactured roller bearing fulfills these requirements.

Engineers recognize that in roller bearings, made of a series of rolls of the full length of the bearing, it is practically impossible to grind the rollers so that they are true cylinders. And particularly is this the case if the rollers are case hardened, or easily flexible.

#### Warpage of Long Rollers

In other words, it is almost impossible in long rollers to eliminate the warpage that occurs due to internal stress from the heat treatment and subsequent finish grinding. Other things being equal, the roller warpage will be proportional to the ratio of the length to the diameter of the roller. It is of course obvious, that if the length and diameter of the roller are nearly equal, the warpage is reduced, and if made equal there is no warpage.

Warpage of long rollers produces misalignment, the load frequently causing them to skew and weave themselves about the inner race. As a slight running clearance has to be provided, this skewing tendency is accentuated and often results in roller breakage, thus ending the usefulness of the bearing.

In any roller bearing, under a static load, the rollers are subjected to a surface compression, as well as bending stresses of varying intensity throughout their structure. Under dynamic load, the rollers are subjected to an additional fatigue stress, which directly affects the load-carrying capacity. This fatigue stress

\*From a monograph prepared by the Hart Roller Bearing Co., Orange, N. J.

is a function of the speed of rotation of the raceway. For a given allowable resultant stress, therefore, the capacity of the bearing will decrease as the speed of rotation increases.

The capacity of a bearing is also directly dependent upon the accuracy and finish of the units entering into its construction. It follows that, for any roller bearing, the accuracy of manufacture of the parts, running clearance provided and quality of material have an important influence on the load carrying capacity and shocks which the bearings will successfully sustain.

When long continuous rollers are employed, the load will practically never be distributed uniformly over the entire length of the roller. It will, rather, be localized at some point, or distributed over a limited portion of the roller length. This is only natural, since warpage usually occurs in long rollers. As a result, some parts of the roller will be stressed excessively, while others will be very lightly stressed.

This unequal load distribution cannot be overcome by using rollers which are flexible, because the end of the roller carrying the greater load will deflect more than the other end. In consequence such rollers become conical, and will not roll in a straight path with axis parallel to the axis of the shaft on which the bearing is mounted. These rollers creep and wear into their retainers.

Bearings should be made of short rolls, their diameter and length practically equal. Where the length of the bearing makes it necessary, the rolls must be staggered and meshed, so as to produce continuous contact with the outer and inner races, and have provision for retaining such proper meshing.

The use of the short rolls overcomes roller breakage, the most annoying characteristic of the continuous roller. In the staggered roll construction, with due attention to roll diameter tolerances, the raceway distributes itself proportionally to each short roll. The rolls, arranged in staggered form, present a multiplicity of raceway supports, and are enabled to adjust themselves absolutely to that portion of the raceway which they carry. The result is a maximum utilization of roll length for load-carrying purposes, incident to full line contact on each roll in the load zone. Therefore this staggered roll construction permits of maximum load carrying capacity per unit length of roll.

The spaces or pockets between the staggered rolls serve as oil reservoirs, feeding the lubricant zigzag to the periphery of the rolls, to the space between the rolls and cage pin, and to the faces of the cage rings. Thus all contact surfaces are thoroughly and automatically lubricated, the rolls themselves giving the lubricant mass such a motion that it distributes itself adequately to all vital points.

## EMPLOYEES' BENEFIT

### Burroughs Adding Machine Co. Organizes New Association

A new employees' relief organization has been formed by the Burroughs Adding Machine Co., Detroit, to succeed an association conducted by that company's employees for 18 years, having been one of the first organizations of this character formed in industrial plants. With the growth of the company and of the Burroughs Relief Association, as the old organization was known, it was apparent that the association had become too large to be handled effectively by an association of employees, and the work of the secretary had become so heavy that he found it impossible to handle the increased volume of business and give the time required for his regular employment in the company's plant.

The company, which has closely co-operated with the relief association, some time ago took up the matter of planning an enlarged organization and referred it to what was then known as its welfare department, which worked out plans of the new organization. As a result the relief association has been succeeded by the Burroughs Employees' Mutual Benefit Fund, which is administered by the company's personal service division with the assistance of an advisory committee consisting of the supervisor of personal service, who is ex-officio chairman, having no vote, and eleven other members elected each year from all the members of the fund. For election purposes the factory is divided into nine districts, each district electing a representative to the advisory committee. The general office is divided into districts and elects two representatives as members of the committee.

The fund is designed for the payment of disability benefits to contributing members for lost time resulting from sickness, accident, and also for making payments to beneficiaries in case of death. Membership is voluntary. The company supplies, free of charge, office space necessary for administering the fund and pays the salaries of all the persons required to keep the records and handle the other details of the work.

There are two classes of contributors to the fund, one designated as Class A and the other as Class B. Class A is composed of members earning \$20 or less per week and Class B for members earning more than \$20 per week. The classification of members is made in January and July of each year. In making claims for benefits the class of a member is determined by the amount of the last dues paid. The dues of Class A

members are 10 cents per week and of Class B members 20 cents per week, being payable weekly in advance. The fund pays to Class A members for time lost because of sickness and injuries, benefits at the rate of \$6 per week, and to Class B members, benefits at the rate of \$12 per week. Payments of sickness benefits commence at the expiration of six working days after the first day of disability. Payments of accident benefits commence on the day following the accident. The benefits are paid weekly for a period not exceeding 13 weeks for the same disability. In the event of the death of either a Class A or Class B member in good standing, resulting either from sickness or accident, \$50 is paid to his beneficiary, in addition to any unpaid sickness or accident benefits which may have accrued.

The money collected for the fund is held by the company in an account known as the Burroughs Employees' Mutual Benefit Fund Account, and all withdrawals from the account are made by check which must be signed by the treasurer or assistant treasurer of the company and must be countersigned by the supervisor of the personal service division. Money in the fund will be invested by the company in securities or loaned to members, all income becoming a part of the fund.

## Development of Steel Salesmen

A word picture of the perfect steel salesman was drawn for members of the Engineers Society of Western Pennsylvania at its regular monthly meeting held at the William Penn Hotel, Pittsburgh, on the evening of June 7, by A. E. Crockett, manager bureau of instruction, Jones & Laughlin Steel Co. The subject of his paper was "The Developing of a Steel Salesman." He pointed out the necessity of picking out men of strong moral character, possessing a good academic training and a natural inclination for selling, to which should be added resourcefulness and a knowledge of how the product is manufactured. These qualifications, the speaker urged, were not sufficient to make a successful salesman, who must be a constant learner and at all times keep abreast of developments within the industry.

The salesman should be obliged to acquire a knowledge of manufacture and while not obliged to be able to make a chemical analysis at least should possess a general knowledge of the chemistry of iron and steel. The speaker paid a warm tribute to James M. Camp, chief of the bureau of instruction of the Carnegie Steel Co., whom he credited with the development of the system of teaching steel salesmen the intricacies of the manufacture of steel.



## WIRE DRAWING

### When It Began and What Gave It Impetus Seventy Years Ago

The wire drawing industry was covered in an unusually interesting and informing fashion by Kenneth B. Lewis, Morgan Construction Co., Worcester, Mass., in an address he made to the employees of the company on Dec. 20. A pamphlet copy of the address with illustrations from old treatises has been printed and doubtless copies may be obtained while the edition lasts.

Early in his account Mr. Lewis makes a convincing claim that "of all mechanical devices employed by man, the wire drawing die presents the most remarkable combination of simplicity and effectiveness." These in brief are as follows:

It elongates metal and reduces its diameter to a degree attainable by no other known method.

It increases the tensile strength and elastic limit of metal, and in combination with heat treatment gives to steel a desired combination of strength and toughness not even approximated by any other tool or process.

It gives to wire a degree of accuracy of size and section otherwise impossible to attain.

It imparts to metal a dense structure, a hard surface and a high degree of polish.

It acts as an automatic testing machine, detecting flaws in the metal and announcing them in no uncertain terms.

Finally, it performs all these functions simultaneously and with no other aid than the simplest application of force, a straight pull.

Quite a little of the address is given up to showing that contrary to assertions long made, the first wire drawing die was not used by a German, Rudolph of

Nuremburg. Instead the records of the city of Paris show that before Rudolph's great-grandfather was born there were in Paris eight wire drawing establishments. Latin manuscripts prove that for 300 to 500 years before the Paris records, wire drawing was practised in its present form.

### What the Hoop Skirt Did for Wire

It was not until the commercial development of the electric telegraph, about 1847, that the first great demand for wire developed. After mills had expanded and improved their practice to handle the telegraph business, another great increase in demand came as the result of feminine fashions. The hoop skirt, formerly dependent on whalebone and other stiffeners of that nature, kept the Worcester mills going at full speed for over ten years. The crinoline wire was a high carbon product and difficult to make, and is responsible for many improvements in the heat treatment of wire. When the hoop skirt fashion collapsed in 1870 it seemed for a time that the wire industry had received a death blow. Fortunately there sprang up at this time demand for a new group of wire products—the wire fence, the wire bale tie, the wire rope and the wire nail.

About 60 lb. of wire are consumed per year by every human being in the United States. Assuming an average gage of 18½, this means that we consume 2 miles apiece. Mr. Lewis says it is safe to say that the amount in service at any one time in and around a single dwelling house will average 2000 lb. In the most highly civilized country 100 years ago the per capita consumption was 3 oz. per year. In his concluding paragraphs covering the existing types or classes of wire mills, Mr. Lewis states that the Morgan mills produce 65 to 70 per cent of all the wire rods used in this country.

### \* Proposed Pig Iron Contract

The executive committee of the Ohio State Foundrymen's Association, held a meeting at Springfield, Ohio, on June 3. A number of applications for membership in the association were received and passed upon. Arrangements were also made to finance the association for the remainder of the year. The principal business to come up was the consideration of a new pig iron contract to be taken up with the sellers of iron. The principal clause in the new contract reads as follows: "In case of accidents, strikes, car shortage, embargoes, or other causes resulting in the stoppage or partial stoppage of the works of either buyer or seller, deliveries herein contracted for, and not delivered within the specified delivery date, shall be cancelled, unless by mutual agreement same are reinstated for delivery at the end of the contract period. Such suspension or cancellation shall not invalidate the remainder of the contract but upon removal of the cause of the interruption, deliveries shall be continued at the specified rate, and if the overdue deliveries have been reinstated, they shall then be made at the regular rate, commencing when the contract would otherwise have ended."

### Foundrymen's Joint Meeting

The New England Foundrymen's Association and the Connecticut Foundrymen's Association held their annual joint meeting at Hotel Garde, Hartford, Conn., June 8, 84 attending. Thomas J. Kelley, secretary Hartford County Manufacturers' Association, who was scheduled as the chief speaker of the evening, was unable to attend owing to illness. Among those who did address the gathering were: H. A. Carpenter, General Fire Extinguisher Co., Providence, R. I.; Vice President Bullard, New England Association, General Electric Co., Lynn, Mass.; R. H. Newcomb, Worthington Pump & Machinery Corporation, Holyoke, Mass.; F. B. Farnsworth, McLagon Foundry, New Haven, Conn.; J. O. Henshaw, Boston, pig iron; George Ray, Taylor & Fenn Co., Hartford, and C. L. Lovell, Walker & Pratt Co., Boston. F. W. Stickle, Capital Foundry Co., Hartford, president Connecticut Association, presided at the dinner.

### Decrease in Steel Corporation's Orders

Unfilled orders on the books of the United States Steel Corporation May 31 were 5,482,487 tons, compared with 5,845,224 tons on April 30. This is a decrease of 362,737 tons and compares with one of 439,541 tons in April, 649,102 tons in March, 639,297 tons in February and 574,958 tons in January, and represents the tenth consecutive monthly decrease reported, and the smallest amount reported since March 31, 1919. The unfilled tonnage a year ago was 10,940,465, or 5,457,978 tons more. The table below gives the unfilled tonnage at the close of each month, beginning with January, 1918.

	1921	1920	1919	1918
Jan. 31.....	7,573,164	9,285,441	6,684,268	9,477,853
Feb. 28.....	6,933,867	9,502,081	6,010,787	9,288,443
Mar. 31.....	6,284,765	9,892,075	5,430,572	9,056,404
Apr. 30.....	5,845,224	10,359,747	4,800,685	8,741,882
May 31.....	5,482,487	10,940,465	4,282,310	8,337,623
June 30.....		10,978,817	4,892,855	8,918,866
July 31.....		11,118,468	5,578,661	8,883,801
Aug. 31.....		10,805,038	6,109,103	8,759,042
Sept. 30.....		10,374,804	6,284,638	8,297,906
Oct. 31.....		9,836,852	6,472,668	8,353,293
Nov. 30.....		9,021,481	7,128,330	8,124,663
Dec. 31.....		8,148,122	8,265,366	7,379,172

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

### Calorific Power of Blast Furnace Gases

A comparison of the calorific power of ordinary and electric blast furnace gases is made by M. Guedras in *Forno Elettrico* for February, 1920. According to an abstract made by *Technical Review*, London, from an account of the original in *Le Genie Civil*, the author investigates the heat balance of the two types of furnace and shows that the gas in an electric furnace has a calorific value of 2257 cal. per kg., or 1450 cal. per cbm., whereas the calorific value of the gases in an ordinary blast furnace is only 638 cal. per kg., or 800 cal. per cbm. The difference in calorific power in the two cases is due principally to the high percentage of carbon monoxide in electric furnace gases. The electric furnace produces a small quantity of relatively rich gas, whereas the ordinary blast furnace produces a large volume of poor gas.

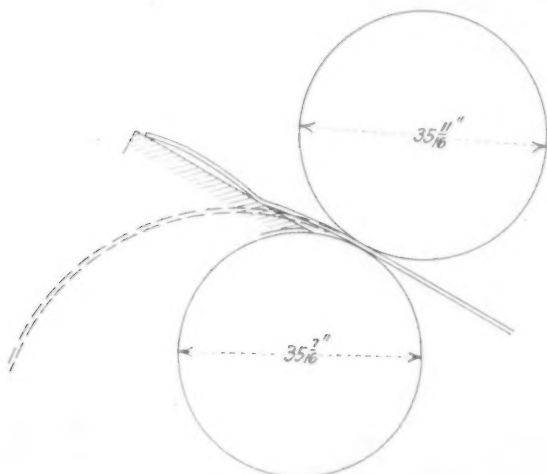


## OVERDRAFT IN ROLLING MILLS

### Effect of Differences in Upper and Lower Roll Diameters

In a discussion on rolling mill practice, published in *Stahl und Eisen*, Dr. Puppe points out the influence exerted by slight differences in diameters of the upper and lower rolls upon the behavior of the section as it leaves the pass. The main points brought out follow, with a few brief definitions as a point of departure.

The "pitch line" is a line parallel to the axes of the top and bottom rolls, and halfway between them. The "rolling line" is a base line parallel to the pitch line,



Effect of Overdraft on a  $\frac{1}{2}$ -in. Flat Rolled in a 36-in. Mill

and immediately above or below it. This forms the basis on which to arrange the pass holes.

If the rolling line is below the pitch line the distance between them is called the "overdraft" and the top roll is therefore larger than the bottom roll. If the rolling line is above the pitch line this distance is called "underdraft" and the bottom roll is the larger.

It is the custom to use "overdraft" for almost all sections. The idea is to prevent any chance of the bar lifting into the air, and to force it definitely against the lower guides, which can be more firmly fixed than the top ones. This object is very desirable, but there are other factors to be taken into account in attaining it. We have to consider the position of the center of gravity of the section, as well as what may be termed the "center of grip."

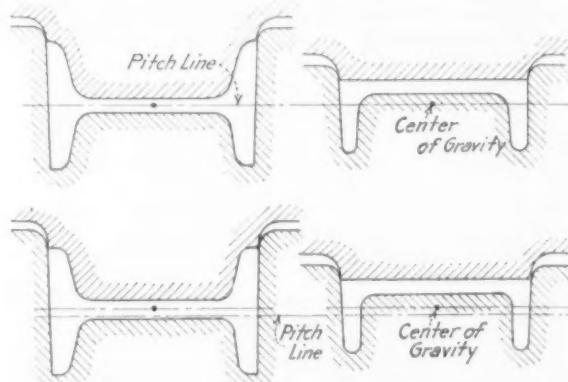
For thin flats, where there is very little friction between the sides of the flat and the roll collar, extremely little "overdraft" is sufficient. One illustra-

tion shows the effect of  $\frac{1}{4}$ -in. overdraft on a  $\frac{1}{2}$ -in. flat rolled in a 36-in. mill. The flat tends to curve as shown by the dotted line (which is drawn to scale). The end of the flat is caught on the stripper and slides forward, setting up a bending moment which tends to straighten it.

As the end advances this bending moment increases, until it exceeds the resistance of the flat. When this point is reached, the flat gives way until a fresh contact is made with the stripper. This process repeats itself, and the result is a wavy bar.

### Keeping Sections from Sticking

The question of overdraft or underdraft for channels and beams is not so simple. In these it often takes



Upper View Shows Pitch Line Coinciding with Center of Gravity of Sections. Much trouble in stripping from rolls will be avoided by allowing considerable underdraft, as in lower view

a very considerable force to release the flanges from their holes, and this must be allowed for. Two figures show a beam and a channel which will obviously tend to stick to the bottom roll. If the usual overdraft were given, this tendency would be increased, and the result would be an enormous pressure on the stripper. To counteract this effect the bottom roll should be the larger one, and quite a considerable underdraft can be given without fear of the bar coming upwards. Similar reasoning also applies to T-bars.

The use of underdraft or overdraft in rolling flanged sections sometimes has a peculiar effect on the mill. The larger roll has a tendency to give the smaller one a higher speed of revolution. If the friction between the bar and the rolls is sufficient, the larger roll will drive the smaller. When the bar leaves the mill the smaller roll will stop until the back-lash in its couplings is taken up and its spindle can resume its drive. This causes the heavy knock which is sometimes heard just as the bar leaves the rolls.

### Waste Material Dealers to Consider Scrap Classification

The classification of iron and steel scrap will be considered at the quarterly meeting of the scrap iron division of the Waste Material Dealers' Association at the Hotel Astor, New York, on June 23, at 11 a. m. A report will be made of the meetings at Chicago and New York between the scrap iron division committee and the consolidated classification committee of the railroads, the latter committee being composed of members of the official, Western and Southern railroad classification committees. The scrap iron division committee has also taken up with the railroad committee the matter of classification as to railroad rates of certain Government salvage material, which has been changed from the status of scrap material to that of new material.

At this meeting those features of the classification employed by the American Railway Association, which are objectionable to dealers, will be discussed and resolutions passed which will be presented at a joint meeting of committees appointed by both the scrap

iron division and the American Railway Association.

A report will be made by the committee, headed by Charles A. Barnes, Perry, Buxton, Doane Co., which has been at work on a set of trade customs covering transactions between dealers and consumers. Possibly a tentative draft of trade customs will be submitted.

The metal division will meet at the same time as the scrap iron division, though in a different room.

The so-called Huber-Commons unemployment insurance bill, which passed the lower house of the Wisconsin Legislature recently, was killed in the State Senate on May 27. The bill was drafted by Prof. John R. Commons, member of the faculty of the University of Wisconsin, and an economist of worldwide reputation.

The Antrim Iron Co., which recently closed its plant in Mancelona, Mich., for the summer, has given free rental of its houses to employees while the plant remains idle. The only condition made is that the men agree to return to their jobs when the company is ready to resume operations in the plant.

# Development of the Bolt and Nut Industry\*

First Machine-Fabricated Product Made  
in This Country Only 80 Years Ago—  
Rapid Strides Made in Recent Years

— BY F. H. CHAPIN —

**I**T is difficult to realize that only about 80 years ago the first machine-made bolt was produced in this country; and, as a matter of fact, it was only a few years previous to that that anything but strictly hand-forged bolts were made anywhere.

There is no recorded history as to when the first bolt and nut were fabricated, but enough has been learned from various sources to prove that this method of holding separate pieces of material together was of very ancient origin and that bolts were manufactured by hand in the same crude bungling way for thousands of years.

A crude sort of bolt forging machine was developed in England about 1830 by Thomas Oliver of Staffordshire. It has always been known in the industry as the "English Oliver," and occupies a conspicuous place in the history of bolt and nut making. From the meager descriptions obtainable the original seems to have been a treadle hammer operated with back treadles so that the boy who worked the bellows could jump on the treadle behind the operator and add his weight to the work of operating the machine. If the boy jumped at just the right time everything was fine, but I suspect there were many cases of mashed fingers due to inaccurate timing of the motive power, and there were no workmen's compensation laws in those days.

The earliest known screw threads were cut with a file; which to us in this age would seem a somewhat tedious process, but appears to have produced satisfactory results for generations. In the course of time this threading process was superseded by an improvement which consisted of filing a series of teeth into a thin, flat piece of steel fastened into some sort of handle, then the bolt was made to revolve by foot power in a lathe and the thread cut by passing the tool over the work a number of times or until the threads were cut sufficiently deep to serve the purpose.

This was the original application of machinery to the making of bolts and was introduced in France about 200 years before the advent of the forging machine invented by Oliver.

## Micah Rugg, the American Pioneer

The pioneer of the bolt industry in this country was Micah Rugg, a country blacksmith, who lived in the small village of Marion, Southington township, Connecticut. Being a Connecticut Yankee he was naturally endowed with mechanical genius and employed his spare moments in working out a heading machine and a trimmer upon which he secured United States patents in 1842. He took into partnership one Martin Barnes, and the firm of Rugg & Barnes was the first to manufacture bolts and nuts for the trade in America, and that was as late as 1843.

The first power used by them was a tread mill propelled by a bull which was employed to blow the fires. Six operatives were employed with a daily production of 500 bolts, and from this small beginning grew the very large and progressive industry as we know it to-day, and which in this country has reached its highest degree of development.

Southington, Conn., can truly be said to have been the cradle of the bolt and nut industry in this country, and those fellows seem to have had some notions, too, on the subject of race perpetuation and apprenticing their progeny in the trade, for I don't remember having met very many bolt and nut makers, who were

the real "Simon pure" article, that didn't come from the Connecticut Valley.

## First Heading Machine in 1850

The methods employed by Rugg & Barnes continued in use as the chief process until 1850, when W. E. Ward invented and produced the first heading machine used in making carriage bolts. In those days a 5/16x3 in. common carriage bolt sold for about \$33 per 1000 and a bolt maker's wage was \$1 per day for 12 hrs. Now this same bolt is sold for about \$7.50 per 1000 (based on \$42 steel), and the operators make from \$6 to \$8 per day for 10 hrs. work, and of course the quality and workmanship of the present product is far superior.

The years that followed have been marked with an incredible number of inventions of machinery for performing each necessary operation, many of which failed to survive the initial stage of plans and drawings, while many others proved worthless after being constructed. They were, however, productive of numerous ingenious ideas which abundantly proved their worth, and from the general mass was evolved the many wonderful automatic and semi-automatic machines of the present. Continuous headers, roll-threaders, automatic screw machines, automatic tappers and threaders, etc., all have contributed to make possible the very remarkable instances of mass production of to-day, there being several factories in the country with capacities for turning out over a million finished bolts with nuts in a 10 hr. day.

During this important period of ingenious effort to achieve economy and rapidity in the production of bolts the possibility of improving the fashion of the bolt itself was for many years almost completely overlooked. The prevailing idea was that a bolt was a bolt and could be nothing else. Its construction was as simple as a hat rack and it functioned as well as required and little thought was given to the possibility of refashioning it to any particular advantage.

## Forging from Round Iron Begun

For a number of years all bolt forging machinery was designed to form bolts from square rods, the neck being left intact and the remainder was rounded and threaded to the required length. This practice was in vogue until as recently as the time of the Civil War, when William J. Clark of Milldale, Conn., brought out the method of forging carriage bolts from round iron.

The invention of the process of making soft open hearth steel, which paved the way to the process of cold forging, had a signal effect upon the industry, as it was almost immediately adopted for cold heading the smaller sizes of bolts.

In 1857 Russell, Burdsall & Ward began manufacturing carriage bolts entirely by the cold forging process and also introduced stove bolts with shaved and slotted heads.

With the advent of the method of making bolts from round iron, things began to happen pretty rapidly in the development of bolt-making machinery, and every shop was both a manufacturing plant and an experimental machine shop, where every manufacturer sought to develop a machine of some kind that would give him the jump on his competitors in some particular feature of the business. Some of these machines worked well, others after a fashion, and for the most part each was jealously guarded with the greatest secrecy to protect the idea from other manufacturers.

This course was not peculiar to the bolt and nut industry. On the contrary it seems to have been in those days the general custom for a manufacturer to

\*From a paper read at the convention of the National Supply and Machinery Dealers' Association at Atlantic City, N. J., May 17. The author is vice-president Bourne-Fuller Co., Cleveland.



build a wall of secrecy around his plant and himself, and to regard his competitors generally with suspicion as if they were constantly endeavoring to crib his mechanical discoveries in the hope of beating him at his own game.

#### Secrecy No Longer Practised

As many of you have no doubt experienced, that policy has been materially changed in recent years in most lines of industry. No trade or profession can make progress to-day where each member selfishly seeks to keep unto himself the knowledge and experience he has gained.

We now welcome, and are welcomed, into each other's shops where we show everything that we are doing (except perhaps an occasional machine that is turning out some bum bolts), and explain any new-fangled ideas of bettering our product and reducing the cost.

Don't get the idea that I am laboring under the erroneous impression that all the improvements in bolt and nut machinery has been made by bolt shop "terriers" in some remote corner of our works behind padlocked doors. No greater credit is due anywhere in this wonderful age of mechanical achievement than to the concerns or individuals who are represented in this convention. Some of the machines that you or your principals have developed, and are supplying to our industry, are veritable marvels for speed, economy, and accuracy. Without them we would be miles behind the procession and our position in the line of industrial progress would not place us in any great danger of a rear-end collision.

It may interest you to know something about how the modern bolt and nut works, which makes anything like a complete line, must be equipped to meet the demand for the different varieties of styles and sizes of bolts in general use.

#### Multitudinous Types of Bolts

The Upson Works of the Bourne-Fuller Co. alone has in its shop over 30,000 different dies for forging, trimming and threading, none of which are duplicates nor are considered entirely obsolete. Now you wouldn't think there could be so many styles and sizes of an article that functions so simply as a bolt and nut, but you don't know how very clever and versatile some of your mechanical engineers are. When they get stalled on some feature of a new machine and crave some form of mental diversion they turn their thoughts to designing a new style of bolt for it. Then it is up to the manufacturer to produce this bolt and sell it for the same price as the standard one previously in use, or a little less. Having exhausted the possibilities in design, he turns his attention to the field of special analysis steel from which the bolts must be made or some special treatment which they must undergo.

I don't wish to be understood as ridiculing the idea of these special bolts and special steel analyses—they are both progressive and it is becoming a more and more common requirement among users, especially in high-class work, to furnish their own steel specifications, and the day of the alloy-steel bolt is not far away for uses that require lightness of weight, resistance to severe strains, to corrosion, fatigue, shock, and so on. Only 20 years ago scarcely anything but iron bolts were made; then steel, supplanting wrought iron as it did in nearly every field, soon revolutionized the bolt and nut industry in this respect until to-day there are very few concerns making bolts from iron, and those are going to steel as rapidly as they can. It is a fair presumption that the bolt of the future will be made from a steel of a particular analysis especially adapted to better withstand the uses for which it is designed.

To renew the multitude of necessary dies, to make special ones, and to make other repairs throughout the works, requires a machine shop equipped with the latest automatic tools and where in normal times a corps of 100 to 125 machinists and helpers are constantly employed.

Electric conveyors, continuous rotary annealing furnaces, automatic screw machines, automatic weigh-

ing and counting scales, all are factors of equipment essential to the shop producing nuts and bolts in large quantities to-day.

#### Lock Nut the Trade Joker

I presume every business has its perennial joker, and so we in our industry have the patented "lock nut." Hardly a week passes that we are not afforded an opportunity to get in on the ground floor of some wonderful new invention in this line upon which letters patent with a big gold seal and a blue ribbon have been issued by the Government. There are a lot of "near-mechanics" in the country who are subject to fits of imagining that they are inventors, and when the spell is on one of them and he just craves to invent something, he cuts loose on a lock nut. He works up some prodigious idea and proceeds to get it patented. The more delirious the idea the quicker the department grants a patent. Last week I was told by an authority on patent matters that there have been 4600 patents granted on lock nut devices in this country. I don't know of a single one of them that is in general use to-day.

#### Electric Truck for Molding Sand

Elaborate time-motion studies on the work of electric storage battery trucks vs. wheelbarrows were recently made by the Yale & Towne Mfg. Co., Stamford, Conn. Accurate records were first made on the cost of handling 600 tons of molding sand, from a freight car on the railroad siding to the molding room in the foundry, 200 ft. away. Forty feet of this distance was a 12 per cent grade up a concrete ramp, with a sharp, right-angle turn into the shop at the top. It took 18 men with wheelbarrows and shovels 6 days, working 9 hr. per day, to transfer the 600 tons of sand. The total cost was \$545.72.

A few weeks later another 600 tons of the same sand, delivered by car to the same point, was transferred to the molding room by means of a Yale electric truck equipped with a standard detachable end-dump body of 27 cu. ft. capacity. With one man driving the truck (one member of the former wheelbarrow gang) and an extra man with a shovel to help load the truck, this 600 tons of sand was transferred in four 9-hr. days, at a total cost of \$183.60.

The table shows some of the details:

Capacity of vehicle .....	Handling Molding Sand by	
	Wheelbarrow	Electric Truck
	5 cu. ft.	27 cu. ft.
Men required:		
To load .....	5	5
To unload .....	4	4
To operate .....	13	1
Total men .....	18	10
Number of 9-hr. days .....	6	4
Labor cost .....	\$495.72	\$183.60
Demurrage on car .....	50.00	None
Total expense .....	\$545.72	\$183.60

#### Return of Prosperity Predicted

J. W. Stannard, Detroit, recently elected president of the Industrial Cost Association, was the guest of honor at a dinner of the Pittsburgh section of that organization, held in that city last week. J. P. McLean, chairman of the Pittsburgh section, presided. Other speakers were M. L. Hemintray, general manager of the Motor and Accessory Manufacturers' Association of New York, and A. W. Barbour, field secretary. In an address Mr. Stannard made he said that the business stagnation in this country he believes is only temporary, and that as soon as business interests get settled and the labor problems get untangled, which he believes will be in a very short time, business all over the world, and especially in America, will enter upon an era of prosperity seldom before experienced. But there must be fairness on the part of capital as well as that of labor. Business men of all kinds must play the game on the square before confidence can be fully restored to trade channels.

The regional meeting of the American Society of Mechanical Engineers scheduled to be held June 13 and 14 in Cleveland has been postponed until October.



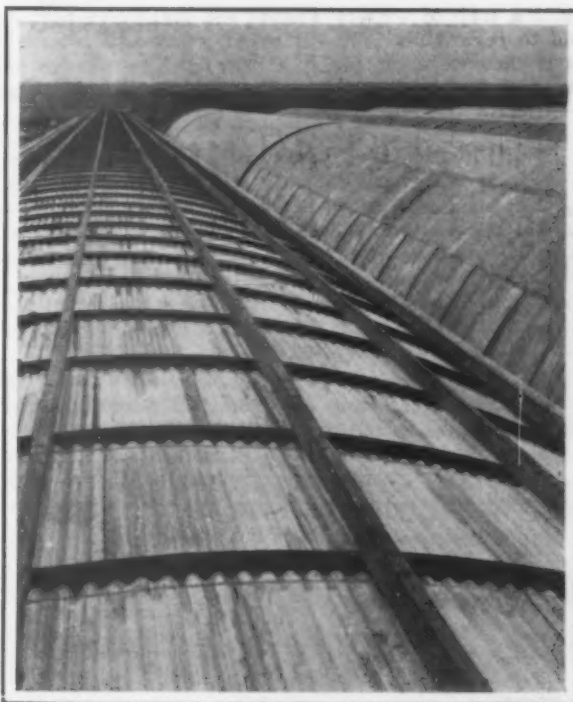
## NISSEN STEEL BUILDINGS

### British Type of Special Construction for Large and Small Units

A type of steel building in which simplicity in construction and speed in erection are claimed to be combined is known in England and other European and foreign countries as the Nissen patent steel buildings. A large wool warehouse was recently completed at Hull, England, by Nissens, Ltd., Birmingham. The area covered is approximately 10 acres and it comprises 18 communicating structures, each 552 ft. long by 40 ft. wide.

One illustration shows three bays under erection. Each semi-circular rib is made up of five segments, joined by fish plates. The ribs, which are 5 ft. apart, are held together by wood purlins of a universal pattern. The buildings are double-skinned with an air space of 7 in. between the inner and outer linings of galvanized corrugated sheets as shown by another illustration. The buildings are thus likely to be damp-proof and not affected by condensation. Gutter troughs are arranged in the valleys between contiguous bays.

Daylight lighting is by two rows of glazing carried on lead-covered steel bars. The end panels have been built of wood, but are, of course, commonly made of brick or concrete block, etc. Special emphasis is laid on the point that unskilled labor may be used for erection; also, that if lined with 2-in. plaster slabs, the interior will be found as cool as that of brick buildings. Ar-



The Erection of the Last Three Bays of a Large Wool House Built of the Nissen Construction Is Represented by One Illustration, the Other Revealing the Air Space Between the Outer and Inner Coverings



rangements are being completed for the Austin Co., industrial engineer and builder, Cleveland, to manufacture and contract for these buildings in the United States.

### Boiler Makers to Meet Next Week

The thirty-third annual convention of the American Boiler Manufacturers' Association will be held at Bedford Springs, Pa., June 20, 21 and 22, business being interspersed with outdoor recreation. The first session will be occupied by a report of E. R. Fish, representing the association on the American Uniform Boiler Law Society relative to funds from members for the promulgation of the code; by a report of Charles E. Gorton, chairman American Uniform Boiler Law Society, relative to the promulgation of the code; discussion and explanations in reference to the simplification of data sheets, stamping of boilers, etc., by Joseph F. Scott, New Jersey Board of Boiler Rules, and C. O. Meyers, Columbus, Ohio. The afternoon will be devoted to sports. In the evening Judge William H. Speer, Jersey City, N. J., will give an address on "Current Menaces to Industry"; L. H. Parks, chief draftsman Arthur G. McKee & Co., consulting engineers, Cleveland, will talk on "The Proper Method of Filing and Numbering Drawings." Motion pictures of iron and steel making at the Midvale Steel & Ordnance Co.'s plants will be shown.

The second morning will be devoted to a discussion on the height of hand fired return tubular boilers above the grate; to a report of the committee appointed to confer with the Stoker Manufacturers' Association by

A. G. Pratt, Babcock & Wilcox Co.; a discussion by S. F. Jeter, chief engineer Hartford Steam Boiler Inspection & Insurance Co., on "Tolerances."

The address of the morning of the closing day will be by F. R. Low, editor *Power*, on "Duties and Possibilities of a Board of National Boiler Inspectors."

Headquarters will be maintained at the Bedford Springs Hotel.

### Will Add Galvanizing Plant

The Empire Rolling Mill Co., Cleveland, which for a number of years has been engaged in the manufacture of black sheets, will erect a galvanizing plant and add galvanizing sheets to its present products. It has placed a contract with the H. K. Ferguson Co. for a one-story galvanizing building, 50 x 140 ft., and a warehouse, 50 x 80 ft., both of brick and steel construction. The company has six hot sheet mills and four cold mills and a present annual output of 20,000 tons of black sheets.

The Clark-Turner Piston Co., Los Angeles, Cal., manufacturer of light weight gray iron pistons, has moved the larger portion of its machine shop into a new building several miles distant without having production fall off meanwhile. The company was formed about two years ago, but the original plant proved too small and the building of the new plant was started to provide besides a machine shop a foundry with an electric furnace, which has been in operation for several months.

## STEEL PRODUCTS RUSTING

### Large Accumulations at South American Ports— The Fight for Trade

Steel products of practically every variety ranging from wire nails to rails are rusting on the docks of Buenos Aires and other South American ports, declined by consignees and resulting in heavy losses to United States shippers, according to William A. Rogers, president Rogers, Brown & Co., sellers of pig iron and coke, Buffalo. Mr. Rogers recently returned from a four month trip through the principal South American countries.

The loss in these products is due mainly to the chaotic condition resulting from the fall in exchange, Mr. Rogers stated. The unclaimed goods are not limited to steel products, but include at one point 6000 automo-

The Krupp factories will be located in what is known as the Lake region.

Steel makers and other manufacturers who built up strong business relations during the war when South America bought iron and steel here, will have to fight to maintain the business, Mr. Rogers believes. One of the principal difficulties standing in the way of continued progress in South American trade with the United States is the freight situation.

"Ocean transportation costs are not materially different between Europe and South American ports, and New York and South American ports," Mr. Rogers said, "but existing freight rates between inland shipping points in this country and the Atlantic seaboard cause what really amounts to an embargo. Then, there is a decided preference by South American business men to do business with Europe."

Court litigation to compel acceptance of American goods bought on contract has brought no relief to



The Excessive Value of the Dollar in Terms of Uruguayan Money Is Responsible for the Congestion of Steel at Montevideo. This photo was taken early in April and shows how the steel is exposed to the weather

biles and other machinery. Much of the material would have been accepted had delivery been made on contract dates before exchange rates reached their present levels.

Consummation of an arrangement for the entrance of the Krupp interests of Germany into southern Chili was made while Mr. Rogers was in that country. Because of the scarcity of coal, the Krupp concern will use wood for the manufacture of charcoal pig iron.

American manufacturers, South American courts holding that terms of a foreign contract have no binding power as against the commercial laws and rules of that country.

The entire group of South American countries is suffering the same acute depression through which we are passing, Mr. Rogers said. The vast possibilities of that continent will be developed, but years will pass in the process, he said.

### Accumulations of American Steel

WASHINGTON, June 13.—Interviews with W. D. Sayle, president Cleveland Punch & Shears Works Co., Cleveland, and J. F. McKeon, Chicago, published in THE IRON AGE of May 19, reciting the reaction in South American countries following the war, and the congestion of steel and other products at ports in those countries are given pictorial substantiation by photos that have been received by the Bureau of Foreign and Domestic Commerce from Edward F. Feely, commercial attaché at Buenos Aires, Argentine.

The photos were taken at Montevideo, Uruguay, early in April and show the results of the unprecedented congestion of the customs warehouses at that port. They are illustrations of the piles of steel and shipments of automobiles which were pending clearance or the acceptance of the shipments which have been refused, Mr. Feely says, by reason of the excessive value of the dollar in terms of Uruguayan money. It was stated that there were at least 2000 automobiles of American manufacture which, like great piles of steel, are exposed to the weather. The automobiles will have to be refinished before they can be sold. The photos of the congested steel piles, including many lines of the heavier products, show tonnages that are stored or left lying miscellaneous in the open for lack of room under roof. A great deal of work has been done in sorting the steel by size and kind, all trace of the marks having been lost in numerous instances. A

charge of \$5 Uruguayan gold is being made for this work by the customs authorities.

It is stated that every steamer which arrived added its quota to the already large accumulation, although imports had fallen off a great deal on March and April.

### Germans Going to South America

WASHINGTON, June 14.—Contracts have been made with the German Immigration Syndicate for the colonization of 2000 German families in Santa Maria Magdalena, in the northern part of the State of Rio de Janeiro, according to a report made to the Bureau of Foreign and Domestic Commerce. A former German vessel is being placed in commission to transport these immigrants whose passage is being advanced by the Brazilian Government. It is also reported that three ships of Russian refugees have left Constantinople for Marseilles, where the emigrants will embark for Brazil.

### Shell Steel Awarded

WASHINGTON, June 14.—Max Solomon, Pittsburgh scrap dealer, the highest of 15 bidders, has been awarded approximately 25,000 tons of shell steel and shell steel forgings by the Ordnance Salvage Board of the War Department. The price received was approximately \$217,251. As noted in THE IRON AGE of last week, the average price bid by Mr. Solomon for the entire lot was \$10.58.

# Heat Distribution in Hot Blast Stoves\*

## Hot Blast Temperature Equalizers— Analysis of Performance Results— Calculations of Convection Velocities

— BY W. E. GROUME-GRJIMAILLO† —

IT is not difficult to show that the construction of a rational apparatus for the equalization of hot blast temperatures is not practicable. Fig. 16 shows the general arrangement of such hot blast equalizers as have been constructed. Assuming that the temperature of the blast is higher than that of the brickwork in the equalizer; the branch A in which the hot gases rise will work irregularly, whereas the branch B, in which the hot gases pass downward will be heated uniformly. The branch A will not heat in a satisfactory manner; the branch B will heat in a satisfactory manner.

Assuming that the temperature of the hot blast drops below the temperature of the brickwork; then

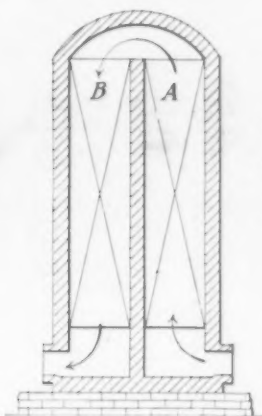


Fig. 16. Hot Blast Equalizer, Showing Travel of Hot Gases Upward Through Chamber A and Downward Through B

the branch A will commence to cool uniformly and rapidly, whereas the branch B will cool irregularly and slowly. As no one has been able to obtain satisfactory results from the use of hot blast temperature equalizers, they are rarely used.

### Iron Tube Hot Blast or Air Heaters

Practically all that remains of this type of apparatus is their description in books, etc. In the Manual of Metallurgy, by Percy Wedding, twelve types of this apparatus are described, some dozen pages being devoted to the construction of iron tube air heaters and the causes which lead to their deterioration. Of the many types of this apparatus, the only ones which have survived are the Besseges and the Cleveland.

Their abandonment was for a very simple reason: All of the iron tube air heaters described by Percy Wedding have the outlet for the waste gases at the highest point. The hottest gases of combustion rise immediately to the top of the chamber, licking the surface of the iron tubes, and heating them irregularly, the top being much hotter than the bottom. Heated this way, the tubes were burnt out, warped and broken.

\*Copyright, 1921, by A. D. Williams.

†Translated by A. D. Williams. Continued from page 1530, June 9 issue, THE IRON AGE.

[Note by translator: Although Prof. Groume-Grjimallo announced his theories over ten years ago, they have not become widely known. A great deal of confusion and lack of knowledge still prevails among the designers of hot blast stoves. The direction of the natural convection currents of hot gases in cooling and cold gases in heating is ignored by constructors of three- and four-pass stoves. Considerable data applicable to the design of stove checkerwork may be found in the translator's articles upon the Design of Open-Hearth Furnaces in the following issues of THE IRON AGE: Feb. 12, March 18, April 29 and May 27, 1920.]

In the Besseges type of air heater the products of combustion pass from chamber to chamber through ports in the division walls, these ports being located at the level of the hearth. In this apparatus the reacting portion of the flaming gases rose and then dropped through zones of uniform heating, where combustion was completed. These local centers of combustion were due to the excess air supply. In proportion as they cooled, these gases dropped lower and lower, uniformly heating all of the tubes, which for this reason worked in a satisfactory manner.

The Cleveland iron tube air heater, which is not so widely known, likewise worked upon the down draft principle (Fig. 17). The disappearance of the numerous types of iron tube air heaters, and the survival of the Besseges and Cleveland designs, supplies a very good example of the importance of giving the correct direction to the circulation of gases in furnaces.

A. E. Maccoun, in his paper before the American Iron and Steel Institute, May 28, 1915, showed the temperature distribution and the approximate isotherms for a Cowper stove at the Edgar Thomson furnaces. The isotherms, being those taken immediately after the stove went on gas and just before going on blast, indicate that the hot gases in cooling tend to flow through those passes which lose the most heat, those closest to the shell of the stove, and that the blast in heating tends to pass through the hottest passes, those in the central portion of the stove.

As this distribution follows natural laws, it cannot

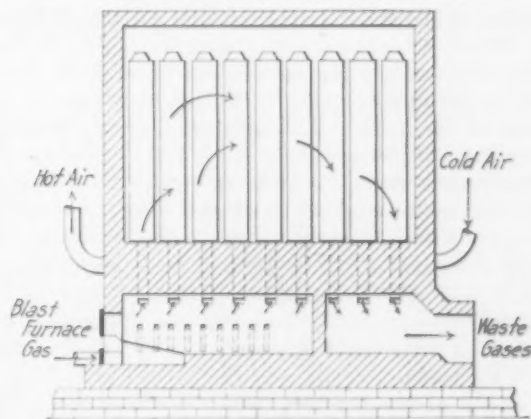


Fig. 17. Cleveland Iron-Tube Hot Blast Stove

be changed except by the application of sufficient insulation around the outside of the brickwork to reduce the amount of heat lost through the shell of the stove. Changing the height of the bridge wall or the dome of the stove or increasing the number of chimney valves will not affect this distribution, provided, of course, that the one chimney valve has sufficient area. Strangulation by insufficient valve area is a common fault, both in hot blast stoves and in many other types of furnaces.

In a paper before the American Iron and Steel Institute in October, 1916, Arthur J. Boynton gave many illustrations of current designs in hot blast stoves, the number of passes varying from two to four. This paper and its discussion seemed to indicate that the laws governing the subdivision of streams of heating



and cooling gases were not yet clearly understood, and this was also shown in the stove designs illustrated. The laws governing the flow of heat and the relationship between the thickness of the wall, of the checker openings and the time required to saturate the heat storage capacity of the brickwork are not understood. The checker wall thickness ranged from 1½ to 3 in., with variations in pass diameter.

TABLE 1  
TEMPERATURE ON CENTER LINE OF CHECKER WALL LAID UP IN STRAIGHT PASSES IN PER CENT VALUE OF THE SURFACE TEMPERATURE OF THE BRICK, ALLOWING FOR THE CORNER EFFECT

Heating Period in Minutes		60	120	180	240
Wall Thickness		Temperature on Center Line in Per Cent of Surface Temperature			
Inches	Milli-meters				
2	50	99.0	99.9	99.99	....
2½	63	94.0	99.5	99.9	....
3	75	91.0	99.0	99.5	....
3½	90	80.0	97.0	98.5	99.8
4	100	70.0	93.0	98.0	99.5
4½	113	59.5	87.0	96.0	99.0

TABLE 2  
TIME IN MINUTES REQUIRED FOR THE CENTER LINE OF A WALL TO REACH GIVEN PERCENTAGE VALUES OF THE SURFACE TEMPERATURE, ALLOWING FOR THE CORNER EFFECT

Center Line Temperature in Per Cent of Surface Temperature		95	90	80	70	60
Wall Thickness		Time in minutes				
Inches	Milli-meters					
2	50	32	26	18	14	12
2½	63	54	42	30	24	20
3	75	76	56	44	32	27
3½	90	106	82	62	50	38
4	100	130	104	76	62	48
4½	113	170	134	98	78	60

Penetration of Heat Through Fire Brick

Tables 1 and 2 were approximated from a curve on page 806 of THE IRON AGE, March 18, 1920, showing the temperature on the central line of a wall of fire brick, in percentage value of the temperature of the surface of the brick. The curve published was based upon a flat wall; in applying this to brickwork built up to form square passes, it is necessary to allow for the effect of the corners, where a square column of brick is formed. As the ratio between the diagonal and the side of a square =  $\sqrt{2} = 1.41$ , the existence of such columns will double the heating time. These times are approximate, only, and would not apply to large passes with thin walls between, nor to small passes with thick walls.

Table 3 shows the relationship between the brick and the free area for different ratios of pass and wall thickness. As a general rule the stove is on gas from two to three times as long as on air. Therefore the cooling period will determine the volume of the brickwork and the checker pass volume required. Tests made by the Bureau of Mines (Bulletin No. 8, The Flow of Heat Through Furnace Walls) indicate a transfer drop in temperature from a hot gas to a brick wall of less than 270 deg. Fahr. Considerable other data indicates a temperature drop, in a gas to gas transfer of heat through checkerwork, of 540 deg. Fahr. This is less than shown in the Cowper stove tested by Mr. Maccoun, where the blast temperature was 1200 deg. Fahr. and the gas temperature 2200 deg., a drop of 1000 deg.

Test of a Two-Pass Cowper Stove

Table 4 consists of data abstracted from the test of a two-pass Cowper stove at the Edgar Thomson

TABLE 3  
RELATIONSHIP BETWEEN THE WALL VOLUME AND AREA TO THE FREE VOLUME AND AREA WITHIN THE CHECKERWORK FOR VARIOUS RATIOS OF WALL THICKNESS AND CHECKER OPENING, BASED UPON SQUARE CHECKER PASSES. THE VALUES FOR THE LAST TWO COLUMNS WERE OBTAINED FROM MR. BOYNTON'S PAPER

Ratio of Wall Thickness to Checker Opening Diameter of Square Pass				Area or Volume Per 100 Units of Area or Space	
Wall	Pass	Wall	Pass	Brick	Free
1.00	0.333	3.00	1.00	93.75	6.25
1.00	0.40	2.50	1.00	91.84	8.16
1.00	0.50	2.00	1.00	88.89	11.11
1.00	0.667	1.50	1.00	84.00	16.00
1.00	1.00	1.00	1.00	75.00	25.00
1.00	1.50	0.667	1.00	64.00	36.00
1.00	2.00	0.50	1.00	55.56	44.44
1.00	2.50	0.40	1.00	48.98	51.02
1.00	3.00	0.333	1.00	43.75	56.25
1.00	3.50	0.286	1.00	39.51	60.49
1.00	4.00	0.25	1.00	36.00	64.00
1.00	4.50	0.222	1.00	33.06	66.94
1.00	5.00	0.20	1.00	30.56	69.44
1.00	6.00	0.167	1.00	26.53	73.47

furnaces in 1913, and contained in Mr. A. E. Maccoun's paper before the American Iron and Steel Institute on May 28, 1915, and the computations based upon this data. The combustion chamber has an area of 40.8 sq. ft. and a height above the burner of 75 ft. 9 in., giving a volume of 3091 cu. ft. The gases in this

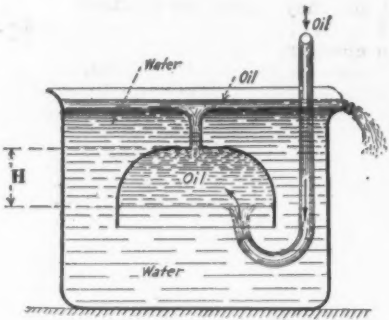


Fig. 18 Illustrates, by Analogy, the Flow of Hot Gases Through an Orifice in the Top of the Combustion Chamber

chamber have a very high temperature, about 2220 deg. Fahr. Assuming their specific weight equal to that of air, this would be sufficient to give them an ascensional velocity as follows:

$$V = \sqrt{2 g H \times d \times a T} = 146.65 \text{ ft. per second.}$$

In this equation, *d* is the specific weight of air (0.08053 lb. per cu. ft.) and *a* is a coefficient.

This would carry the gas to the dome in a half second. The average time the gases remain in this chamber is around five seconds, based on their average temperature in the stove. The volume of gases formed each second in the combustion chamber is:

152.2 × 5.404 = 822.5 cu. ft. with 40 per cent excess air,  
167.7 × 5.404 = 906.5 cu. ft. with 80 per cent excess air,  
which would make the average area of the ascending column less than 7 sq. ft., or less than 20 per cent of the combustion chamber area. The gas shoots across the short diameter of the chamber and smashes into the wall. As a result of these conditions the flame in the combustion may take on a resonant vibration in a manner similar to the "singing flame" of the physical laboratory.

Mushrooming of the burner jet is one of the causes for the flame coming out around the burner. The hot column of blazing gas will rise through the stagnant gases in the combustion chamber and, due to the fact that the convection currents for gas are readily set up, there will be considerable recirculation. Noisy burning is a well-known feature of stove operation. The mushrooming of the gas jet assists in the mixing, and further mixing is effected when the gases reach the dome. Mr. Maccoun's test proved that unburned gases

reached the dome, but did not pass down into the checkerwork.

#### Draft Considered—Pressures Involved

Draft conditions existing in a stove are peculiar, inasmuch as it may happen that there will be a greater draft depression at the chimney valve than at the foot of the stack. This arises from the following conditions: There will be an upward pressure in the combustion chamber and likewise, to a lesser extent, in the checkers; these counterbalance each other. Assuming for the sake of simplicity that the waste gases, etc., have the same specific weight as air, the upward pressure in the combustion chamber will be:

$$D_1 = 75.75 \left( d - \frac{d}{1 + \alpha T} \right) = +1.03 \text{ in. of water.}$$

In the checker this upward pressure will be:

$$D_2 = 85.6 \left( d - \frac{d}{1 + \frac{2200 + 504}{2 \times 491}} \right) = 0.97 \text{ in. of water.}$$

	Pressure, In. of Water, Column
Upward pressure in combustion chamber.....	+1.03
Upward pressure in checkerwork.....	+0.97
Difference or positive pressure acting at chimney valve .....	+0.06
Draft depression at chimney valve.....	-1.51
Draft depression at chimney valve due to stack will therefore be .....	-1.45
Upward pressure in checker.....	+0.97
Draft depression in dome of stove due to chimney .....	-0.48
Upward pressure in combustion chamber.....	+1.03
Making a draft depression at the burner available to draw in the air required for combustion .....	-1.51

#### Analysis of Volumes and Velocities

It has been suggested that combustion conditions in the two-pass Cowper stove may be improved by springing an arch across the chamber, with an opening proportioned to retard the flow of the gases to such an extent that combustion occurs in the chamber. The location of the arch will be fixed by the amount of gas burned and the time required for combustion. Two seconds may be allowed for combustion. Under incandescent chamber conditions, with good mixing, combustion will be very rapid. The size of the chamber and port may be arrived at as follows:

$$\text{Chamber volume} = 906.5 \times 2 = 1813 \text{ cu. ft.}$$

$$\text{Height of chamber} = 1813 \div 40.8 = 44.4 \text{ ft.}$$

It is necessary to provide an opening in the arch over the top of the combustion chamber, which will permit the waste gases to escape, and yet restrict their flow sufficiently to supply time for the completion of combustion (Fig. 18). This area may be determined by the use of Yesmann's formula, as follows:

$$Q = k_1 k_2 A \sqrt{2gH \frac{d_a - d_g}{d_g}}$$

In which:

$Q$  = the quantity of gas flowing in cubic feet per second; for the case in hand,  $Q_{2000} = 906.5$  cu. ft.

$H$  = the head at the orifice or the vertical distance from the orifice to the lower free surface of the gases; for the case in hand  $H = 44.4$  ft.

$2g$  = gravitational constant =  $2 \times 32.185 = 64.37$  ft. per sec. per sec.;

$d_a$  = specific weight of air = 0.08053 lb. per cu. ft.

$d_g$  = weight per cu. ft. of gases at combustion chamber temperature; in this case  $T = 2200$  and  $0.08053 \div (1 + \alpha T) = 0.0147$  lb. per cu. ft.

$A$  = Area of orifice in sq. ft.

$k_1$  = coefficient of contraction of the jet, or the ratio between the area of the contracted vein and  $A$  (in hydraulics the contracted vein for a circular orifice is about 0.67A);

$k_2$  = velocity coefficient, or the ratio between the actual velocity in the contracted vein and the theoretical

velocity (in hydraulics the velocity in the contracted vein is about 0.97v).

As  $k_1$  and  $k_2$  have not been accurately determined for gases, for the case in hand they may be assumed as equal to unity and the formula, inverted, becomes, for the particular case:

$$A = \frac{906.5}{\sqrt{64.37 \times 44.4 \times \frac{0.08053 - 0.0147}{0.0147}}} = 8.013 \text{ sq. ft.}$$

The velocity through the orifice will be:

$$906.5 \div 8.013 = 113 \text{ ft. per second.}$$

A combustion chamber of this kind might be constructed in an old stove, but it would be difficult to maintain with dirty gas. The furnace dust has a fluxing tendency upon the brickwork and in many cases forms a heavy deposit. In his discussion of Mr. Boynton's paper, R. J. Wysor presented some interesting photographs showing the fluxing action experienced at South Bethlehem. The fume at these furnaces is high in alkali.

The stove tested was provided with three chimney valves and was operated in different runs with all three and with only two. The valves were 20½ in. in diameter, giving an area of 2.29 sq. ft. each. The average temperature at the chimney valve was about 540 deg. Fahr. The volume of gas flowing per second,  $Q_{2000} = 167.7 \times (1 + \alpha t) = 340$  cu. ft.; therefore the velocities will be:

$$\text{With three valves, } v = \frac{340}{3 \times 2.29} = 49.5 \text{ ft. per sec.};$$

$$\text{With two valves, } v = \frac{340}{2 \times 2.29} = 74.2 \text{ ft. per sec.}$$

The pressure, in inches of water, required to impress this velocity upon the gases will be:

With three valves:

$$p_3 = \frac{(49.5)^2}{2g} \times \frac{0.08053}{1 + \alpha t} = 0.29 \text{ in. of water.}$$

With two valves:

$$p_2 = \frac{(74.2)^2}{2g} \times \frac{0.08053}{1 + \alpha t} = 0.65 \text{ in. of water.}$$

The draft depression at the chimney valves was 1½ in. of water. Therefore, from 20 to 43 per cent of the draft at these points was required to supply a sufficient velocity to remove the waste gases. This would seem to indicate insufficient valve area. Two valves tend to strangle the stove; with three the strangulation is lessened.

Chimney valves form a weak point. Any leakage of blast at this point is effectually concealed. A multiplicity of valves increases the opportunity for valve defects, but at the same time permits blanking a valve, if necessary, without shutting down the stove for any length of time. Large valves are costly, but one large valve reduces the number of potential leakage points. The lowered velocity reduces the draft required in proportion to the square of the velocity. The friction and other losses are likewise reduced.

#### Velocities of Gas in Checkers

Distribution of the gases through the checkerwork will be affected not by the number of chimney valves, dampers and partitions, but by the friction, heat loss, etc. The rapidity with which the current of gas gives up its heat in any particular checker pass will determine the quantity of gas flowing in that pass. A mathematical demonstration of this is given in Groume-Grjimmalo's work, and the distributions of the isotherms, as shown in Fig. 6 of Mr. Maccoun's paper, confirm this.

Convection currents have a natural velocity higher than is generally appreciated. Table 5 gives the convection velocities for various average temperature differentials acting through heights of ¼, 1, 10 and 40 ft. The checkerwork is 78 ft. 9 in. high; the velocity average for the blast and the hot gases is 8.63 ft. and 7.9 ft. per second, which is less than the convection velocity for an average temperature differential of 10

deg. Fahr. acting for 40 ft. The temperature differential for the blast in the checker is about 1050 deg. and of the gases about 1700 deg. Fahr.

Through the checkerwork the convection currents act in the same direction as the flow of the blast and the gases. Therefore the convection circulation tends to make every particle of the gases wipe every unit of

TABLE 4

DATA ABSTRACTED FROM "BLAST FURNACE ADVANCEMENT" BY A. E. MACCOUN PRESENTED BEFORE THE AMERICAN IRON AND STEEL INSTITUTE MEETING, MAY 28, 1915

Test of a 22x100 ft. Two-Pass Cowper Hot Blast Stove:			
Heating surface of checkers	51,192	sq. ft.	
Total of stove	55,866	sq. ft.	
Combustion chamber, Area	40.8	sq. ft.	
Height to burner	10.625	ft.	
above burner	76.75	ft.	
total	87.375	ft.	
Volume, below burner	468	cu. ft.	
above burner	3,092	cu. ft.	
Total	3,560	cu. ft.	
Dome Volume	1,381	cu. ft.	
Checkers, 329 passes	6x6 in.		
Total area of passes	82.25	sq. ft.	
Perimeter of one pass	2	ft.	
329 passes	658	ft.	
Height of	77.75	ft.	
Heating surface = 658x77.75 =	51,160	sq. ft.	
Wall thickness = (6+3) <sup>2</sup> =	81	sq. in.	
Area per pass = (6 <sup>2</sup> ) =	36	sq. in.	
brickwork per pass (difference)	45	sq. in.	
percentage of in brick (Table 3)	55.56		
in pass (Table 3)	44.44		
81			
total checkers = —x329 =	185.06	sq. ft.	
144			
passes = —x329 =	82.25	sq. ft.	
144			
brick = 185.06—82.25 =	102.81	sq. ft.	
Volume, Total brick and passes			
Passes = 82.25x77.75 =	14,390	cu. ft.	
Brick = 82.25x77.75 =	6,395	cu. ft.	
Weight 7,995x112.5 =	899,400	lb.	
	40 Per	80 Per	
	Cent	Cent	
	Excess	Excess	
Air supply for combustion of			
gas. Volumes cu. ft. per sec-			
ond at 32 deg. Fahr., atmos-			
pheric pressure	593	80	80
32 deg. Fahr., 14.7 lb. gage	246	....	....
Temperatures, deg. Fahr.:			
Maximum	1,202	2,228	2,228
Minimum	158	536	536
Average	680	1,382	1,382
Change	+1,044	-1,692	-1,692
Gas factors for average tem-			
perature	2.32	3.75	3.75
Air supply, per cent of gas			
volume	....	95.0	123.0
Volume, cu. ft. at 32 deg.			
Fahr., atmospheric pres-	....	76	98
sure	....		
Products of combustion per			
cent of gas	....	182.0	210.0
Volume, cu. ft. at 32 deg.			
Fahr., atmospheric pres-	....	152.2	167.7
sure	....		
Volumes, cu. ft., at average			
temperature and pressure	687	571	629
Average time in seconds to			
pass through:			
Combustion chamber	4.50	5.42	4.94
Dome	2.02	3.45	2.21
Checker	9.14	11.00	9.98
Total	15.66	19.87	17.13
Temperature change, average			
deg. Fahr. per sec., based on			
total volume	66.8	85.2	98.8
On checker only	114.3	153.9	169.6
Velocity, average in checker,			
ft. per sec.	9.38	7.16	7.89
Heat capacities in B.t.u. per			
100 molecular volumes from			
curves:			
Gases at 2228 deg. Fahr.	....	7,738	8,809
Blast at 1202 deg. Fahr.	1,845	....	....
Gases at 536 deg. Fahr.	....	1,488	1,718
Blast at 158 deg. Fahr.	198	....	....
Difference	1,647	6,250	7,091
B.t.u. released or absorbed per			
sec.:			
(80 x 1.267* ÷ 100) x			
6250 =	....	6,329	....
(80 x 1.267* ÷ 100) x			
7091 =	....	....	7,178
(593 x 1.267 ÷ 100) x			
1647 =	12,380	....	....
B.t.u. absorbed in one hour on			
blast = 12380 x 3600 =	44,568,000	....	....
B.t.u. released from gases in			
2.8 hr. (= 10080 sec.):			
6329 x 10080 =	....	63,796,000	....
7178 x 10080 =	....	....	72,354,000
The total average temperature			
change in brickwork of			
checkers will be in deg.			
Fahr.	198.2	283.7	321.8
The loss between the heat in			
the blast and the gases			
will be:			
63,796,000—44,568,000 =			
19,228,000 =	....	30.1%	....
72,354,000—44,568,000 =			
27,786,000 =	....	....	38.4%

The above covers merely the interchange loss in stove checkers. If the total heat released by the gases is considered, down to 32 deg. Fahr., the following will govern:

B.t.u. released by gases per sec.:	Blast	40 Per Cent Excess	80 Per Cent Excess
(80 x 1.267 ÷ 100) x 7738 =	....	7,833	....
(80 x 1.267 ÷ 100) x 8809 =	....	....	8,920
per cycle 7833 x 10080 =	....	78,957,000	....
per cycle 8920 x 10080 =	....	....	89,914,000
78,957,000—44,568,000 =	....	43.5%	....
34,389,000 =	....	....	....
89,914,000—44,568,000 =	....	....	50.4%
45,346,000 =	....	....	....

\*The value 1.267 is the number of molecular volumes in 1 cu. ft.

†Assuming specific heat of brick at 0.25, a change in temperature of 1 deg. Fahr. will mean 899,400 x 0.25 = 224,850.

surface. This fact was demonstrated many years ago by Peclet at the Institute of Arts and Sciences, Paris, but is still ignored by many.

In the combustion chamber the convection currents will be in the direction opposite to the flow of the blast and the gases. For that reason it is probable that readings taken slightly below the top of the dome would show a higher blast temperature than would be found at the hot blast valve, lower down.

Study of Table 4 reveals several interesting facts in regard to the two-pass stove which was tested. Hot blast stove temperatures are comparatively low, both as regards the temperatures realized from the burning of the gas and the hot blast temperature. In this stove the gas to gas differential was about 1080 deg. Fahr., which is nearly double that for other types of regenerator. The rate of heating and cooling is low; that is, the average temperature change per second in the blast heating and the gases cooling. The checker contains 8.63 sq. ft. of heating surface per cubic foot of free air per second, or, if the average volume of the blast in the checker is considered, this ratio becomes 7.42 to 1.

TABLE 5

VELOCITY OF CONVECTION CURRENTS RESULTING FROM VARIOUS AVERAGE TEMPERATURE DIFFERENTIALS ACTING FOR DIFFERENT HEIGHTS

Temperature Difference, Deg. Fahr.	Velocity in Feet per Second			
	Height 3 in.	Height 1 ft.	Height 10 ft.	Height 40 ft.
1	0.1811	0.3622	1.145	2.291
2	0.2561	0.5123	1.620	3.240
3	0.3137	0.6275	1.984	3.968
5	0.405	0.810	2.561	5.123
10	0.5727	1.1455	3.622	7.245
20	0.810	1.620	5.123	10.245
30	0.992	1.984	6.275	12.55
40	1.1455	2.291	7.245	14.49
50	1.2808	2.561	8.10	16.20
60	1.403	2.806	8.873	17.745
70	1.515	3.031	9.582	19.165
80	1.620	3.240	10.245	20.49
90	1.718	3.436	10.867	21.735
100	1.811	3.622	11.455	22.91
150	2.218	4.436	14.03	28.06
200	2.561	5.123	16.20	32.40
300	3.137	6.275	19.84	39.68
400	3.622	7.245	22.91	45.82
500	4.05	8.10	25.61	51.23
600	4.436	8.873	28.06	56.12
700	4.791	9.582	30.305	60.61
800	5.123	10.245	32.40	64.80
900	5.434	10.867	34.365	68.73
1000	5.727	11.455	36.225	72.45
1200	6.275	12.55	39.68	79.36
1400	6.776	13.552	42.86	85.72
1600	7.245	14.49	45.82	91.64
1800	7.684	15.368	48.60	97.20

The rate of heat absorption by the blast averages 0.243 B.t.u. per square foot of heating surface per second. The fact that the isotherms at the upper end of the checker are much closer together than lower down may be interpreted as indicating that this end of the checker worked too cold, due possibly to the greater heat loss through the walls and shell of the stove.

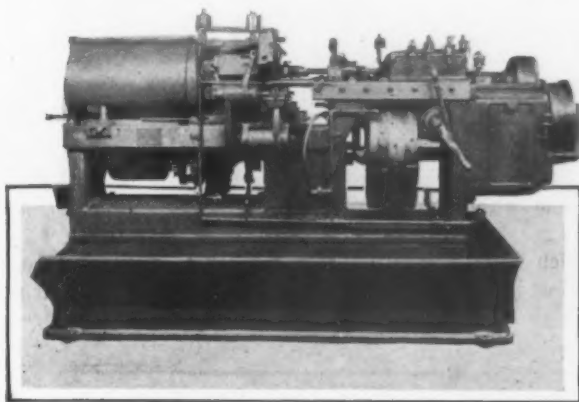
(To be concluded)



## New Britain Automatic Screw Machine

The New Britain Machine Co., New Britain, Conn., maker of 2½ x 9½-in., 1½ x 7-in., and 1 x 5-in. six-spindle automatic screw machines, has developed a ¾ x 3¾-in. machine. The new automatic in general construction is similar to those previously manufactured by the company, but in view of high spindle speed requirements added features have been incorporated.

The machine will carry six end-working and four side-working tools. The operations which the machine is adapted to perform are practically the same as the previously manufactured automatics, except that at the fifth position, where threading or any other end operation is carried on, there is also provision for using the side cutting tool on a duplex slide, which will then also carry a side cutting-off tool for work in the sixth position. In the fifth position the tool slide has an enlarged hole for the shank of tool holders, which hole is bushed to fit holders and fitted with bearing cap. The removal of this cap and bushing makes it possible to take out any spindle by indexing it into



Spiral Gears Are Employed for Quiet Driving of the Spindles. The angle of the spiral is set to keep the spindles back against the ball thrust bearings

the fifth position without disturbing the cylinder or tool slide. Access to the spindle boxes and the ball thrust bearings is had in this fifth position.

For quiet driving of the spindles, spiral gears are employed with the angle of the spiral set to always keep the spindles back against the ball thrust bearings. Each spindle and nose are made integral of alloy steel hardened on all bearing and wearing surfaces. The combination of spiral gear drive and the hardened bearings is particularly desirable at high spindle speed. There is also a spring action on the chucking fingers for resisting centrifugal force at high speeds and to release the grip on the stock promptly in feeding out new lengths of work.

The main driving shafts are carried in ball bearings designed to take radial and axial loads and economize power. Changes in the threading mechanism are made by substituting gears on fixed centers in the same manner as the feeds and speeds are changed. The indexing mechanism is actuated by elliptical gears to accelerate the indexing motion and shorten the inactive periods between tooling. There are no cams or levers located in the open space between the spindle cylinder and tools, but a free, open, slanting surface for directing chips into the pan.

The production capacity of the new automatic ranges from forty to fourteen hundred pieces per hour. Specifications are as follows: Capacity of chuck, round, ¾-in.; capacity of chuck, square, 0.443-in.; capacity of chuck, hexagon, 0.542-in.; length that can be milled, 3-in.; length of feed, 3¾-in.; diameter of spindle, 1¾-in.; size of tool shanks, 1¼-in.; speed of countershaft, 775 r.p.m.; driven pulley on counter, 10-in.; driving pulley on counter, 12-in.; pulley on machine, 12-in.; width of belt driving counter, 3¾-in.; width of belt driving machine, 3-in.; ratio of gears, driving spindles, 8 to 7.

The floor space occupied by the machine is 7 ft. 7 in. x 3 ft. 1 in. Its weight with the countershaft is 5,000 lbs.

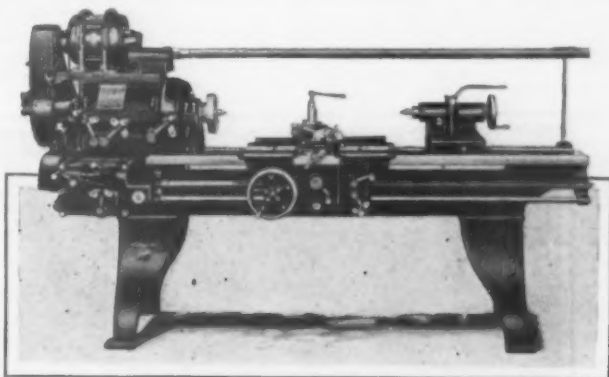
## Geared-Head Lathe

A single pulley driven geared-head lathe, built in 16, 18 and 22-in. sizes, has been added to the line of machine tools offered by the Morris Machine Tool Co., Cincinnati.

Twelve spindle speeds are provided and with a double friction countershaft twenty-four speeds, twelve forward and twelve reverse, are obtainable. Speeds are secured through sliding gear and a single positive back gear clutch, friction clutches and parts requiring adjustment having been eliminated. The only friction clutch is in the pulley at the initial drive and this is of large diameter, and is controlled by a shifter rod running the full length of the lathe. Speed changes are made by levers in front of the head. The two levers at the back end control a set of sliding gears, giving six speeds. The lever at the front when engaging the direct drive clutch, slides the back gear pinion out of mesh, preventing the back gears from running idle at high speed and absorbing unnecessary power. The speed range for the 16, 18 and 22-in. lathes is 12 to 347 r.p.m., 10 to 297 r.p.m., and 10 to 297 r.p.m., respectively.

The new geared-head lathe is interchangeable with the cone head lathe, and all geared heads are arranged to receive the motor drive unit at any time. The motor is mounted on a plate, bolted to the head and drives the clutch pulley by an endless belt which is furnished with the motor drive details. An idler pulley adjusts the tension of the belt by means of the star handle at the front of the motor plate. The idler pulley and bracket are mounted on the motor plate, making the motor drive a self-contained unit.

When releasing the friction clutch in the pulley, a brake can be applied by the same pull which stops the idle rotation of the spindle. This is featured as a



Speeds Are Secured Through Sliding Gear and a Positive Back Gear Clutch. Friction clutches and parts requiring adjustment have been eliminated

convenience when shifting gears and when turning work partly around for inspection at different points on the diameter.

## Few Unadjusted Claims

WASHINGTON, June 14.—With the work of the War Minerals Relief Commission completed about one month ago, and claims which have been acted upon sent to the Secretary of the Interior for his approval, there are about 50 being held in the office of the Secretary for review. A report of the work of the commission will be sent to Congress and the unexpended funds stated as soon as practicable. The Secretary has appointed Ira E. Robertson of Grafton, W. Va., to care for such details as may arise.

The George J. Hagen Co., Pittsburgh, recently was awarded the contract of the Nash Motors Co. for a 85 K. W. rotary type electric furnace. The Hagen company recently placed in operation at the Nash Motors Co. a rotary electric furnace having a connecting load of 270 K. W. This furnace is used for heat treating and annealing of automobile parts. The Hagen company also reports an order from the Canadian Allis-Chalmers Co. for a 210 K. W. car type sheet steel annealing furnace.

## BLOOMING MILL MOTOR DRIVE

### Set for India Includes Induction Motor, Generators, Flywheel and Double Motor

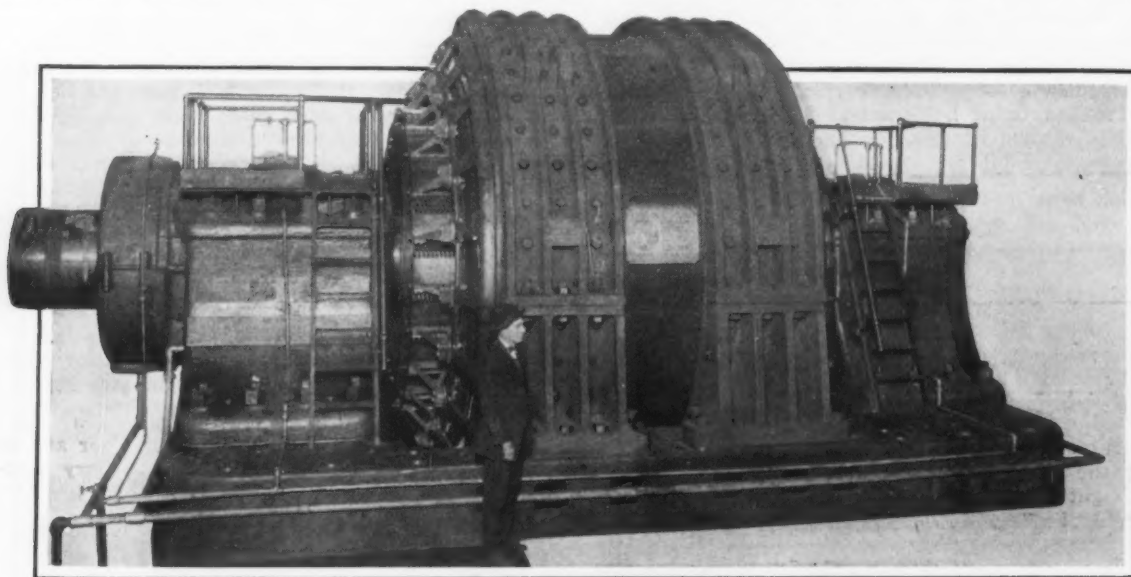
For the Tata Iron & Steel Co., Jamshedpur, India, the General Electric Co. has completed a 40-in. reversing blooming mill motor drive, complete with reversing motor, flywheel, motor generator, control and auxiliaries. This electrical equipment is of the same type as those which have been supplied to the Tennessee Coal, Iron & Railroad Co., Trumbull Steel Co., Bethlehem Steel Co., and other mills.

The reversing motor is of the double unit type,

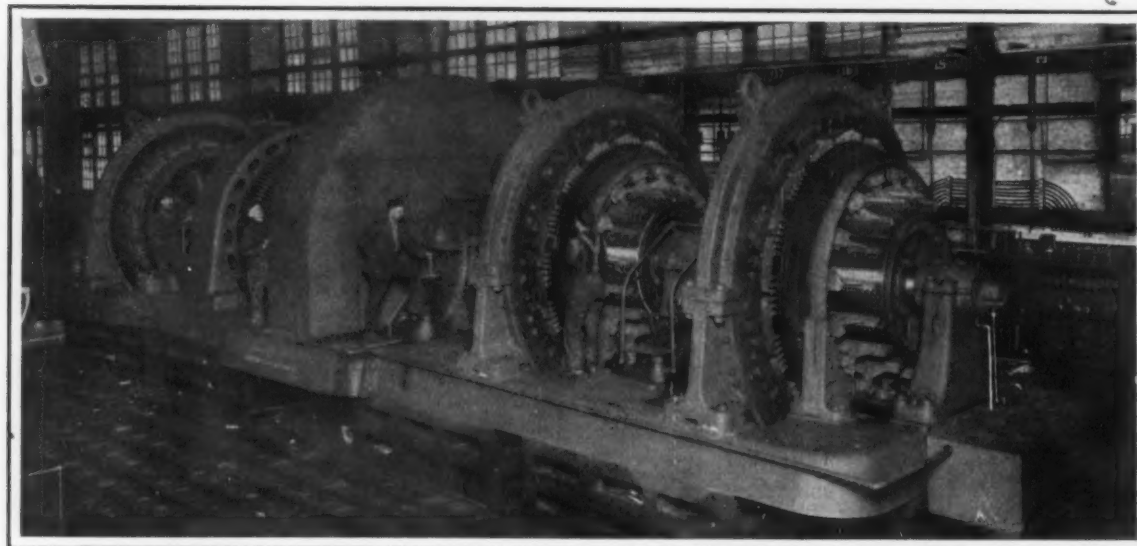
The total weight of this complete pillow block, with its bearing and thrust plate, is approximately 61,000 lb.; the bolts which secure the cape to the pillow block, and the pillow block itself to the base, weigh approximately 2400 lb.

In operation, similar equipment at the Trumbull Steel Co., driving a 36-in. reversing blooming mill, has rolled one 22 x 20 x 60-in. ingot weighing 6700 lb. down to a 6 $\frac{1}{4}$  x 6 $\frac{3}{4}$ -in. bloom in 11 passes in 45 seconds. Fifty-seven such ingots, having a total weight of 190 short tons, have been rolled to the same final dimensions in one hour.

At the Sparrow's Point works of the Bethlehem Steel Co. the 40-in. reversing mill is driven by a very similar electrical equipment. This mill has rolled one



Current at 4000 Volts Runs Through the 500-Hp. Induction Motor Near Left End of Lower View, Turns It at 375 r.p.m., and with It the 50-Ton Flywheel, in Casing, and the Three 2700-Hp. 600-Volt Direct-Current Generators on the Same Shaft



Current from the Three Generators Turns the 7000-Hp. Blooming Mill Double Motor (Above) at 55 to 120 r.p.m.

consisting of two shunt wound motors on a common shaft, and is rated 7000 hp. at 55 to 120 r.p.m., with a maximum momentary capacity of 22,000 hp. at 50 r.p.m. Power is supplied by a flywheel motor generator, composed of three 2700-kw. generators and one 50-ton flywheel, all driven by a direct-connected induction motor, having a continuous capacity of 5000 hp. at 375 r.p.m.

To withstand the severe shocks to which they will be subjected, the motors are of very strong construction throughout. A good example of this construction is the mill end bearing, 30 in. in diameter by 70 in. in length, mounted in a spherical seat on a cast steel pillow block which also supports a lubricated babbitted thrust plate, against which the motor half of the coupling may bear in case of a broken mill spindle.

23 x 43-in. ingot weighing 16,500 lb. to a slab 9 x 38 in. in 80 seconds, and to a bloom 8 x 8 in. in 2 minutes 15 seconds. This mill has also rolled 330 tons of 10 x 40-in. slabs in one hour and 198 tons of 8 x 8-in. blooms in an hour. Such figures tend to show that the modern electrically driven reversing mill has arrived as far as tonnage output is concerned.

Oglebay, Norton & Co., Cleveland, are distributing their iron ore book for 1922. This firm is listing one ore not previously shown in their booklet. This is the Sarkins, a coarse hematite from the Masabi range, and is a mixture of the Hawkins washed ore and the Sargent ore. The properties from which this ore come belong to the Wisconsin Steel Co., the Cleveland firm being the selling agent for the ore.



# Iron and Steel Jobbers' New Problems

Annual Convention at Montreal Discusses Present Conditions and Finds Grounds for Hopeful Views — Andrew Wheeler Elected President

THE twelfth annual convention of the American Iron, Steel and Heavy Hardware Association had an added flavor of interest in being held on Canadian ground. Montreal is a desirable city to sojourn in and the co-operation of the Canadian jobbing interests centered there made the stay of the convention attendants particularly pleasant. A considerable delegation went by special car from New York. There was also a Boston car. The meetings were held at the Windsor Hotel, beginning Tuesday, June 7, and concluded on Thursday, June 9. Secretary A. H. Chamberlain in arranging for the meeting had the help of a number of representatives of the Canadian Wholesale Hardware Association and the result was a highly successful convention, both in respect to the papers and reports submitted and the social and business contacts, which are always among the most valuable features of such gatherings.

President Eugene J. McCarthy, of Beals, McCarthy & Rogers, Inc., Buffalo, faced a gathering of about 200 when he called the convention to order Tuesday morning. The greetings were given by Col. Robert Starke, of Starke-Seybold, Ltd., Montreal, president Canadian Wholesale Hardware Association, and by W. M. Birks, Henry Birks & Sons, Ltd., vice-president Montreal Board of Trade. The response for the active members was made by ex-President S. L. Orr, Orr Iron Co., Evansville, Ind., and the response for associate members by C. O. Hadly, Alan Wood Iron & Steel Co., Philadelphia.

## President's Address

President McCarthy, in his excellent annual address, discussed the present business situation in the light of all the developments of the war years in iron and steel, and of the two years following the armistice. He said frankly that in spite of the danger signals flying in the early months of 1920, few saw far below the surface. "The great majority of producers and business men clung to the agreeable belief that until the world shortage of goods caused by the diversion to war work could be corrected, there could not possibly occur an extended period of deflation or business action." The address traced the course of trade in the second half of 1920—the sudden reaction in the steel trade and the stoppage of buying in so many lines on which the steel trade depends. In dealing with the possibilities of the future Mr. McCarthy said:

## What Is in Store

"Now, what is before us? Is history going to repeat itself? After the Napoleonic wars, England experienced a period of 30 years of liquidation and deflation. After our own Civil War, the United States had approximately 14 years. It seems to me that the present period is not only the culmination of a generation of inflation and rising costs, but is in fact the actual turning point in the other direction. Better times are before us. It may sound paradoxical, but it is a fact that a community prospers more when costs are low than when costs are high. The great nations of the world have become rich during periods of falling prices, not poor. The period after our Civil War was the time

when the foundations of our own industrial power were laid. It was a period of decline in commodity prices and improvement in the standard of living.

"The period ahead of us should be marked by a return to the old legitimate methods of production. Men's talents will be turned once more to the urgent need of reducing costs and improving the quality of output. Whether from inclination or not, we will do these things, because it will be the only sure road to success—it is the one road which insures future prosperity. It is the road that business in this country is already starting on. A year ago we found it easier to boost prices than to use brains and creative intelligence. Such is not the case to-day.

## Impulse from Agriculture

"The present situation calls for the real energies of labor and management; what the country needs to start the ball of business activity rolling is the initial impulse, and this may be furnished by the present year's planting. Agriculture is still our great basic industry, and is the principal source, not only of our primary wealth, but also of our business vitality. Fifty per cent of the purchasing power of the country lies in the farmer. The power of this impulse is indicated by the fact that more than 13,000,000 people in the United States are engaged in agriculture.

"The basic conditions for a revival of trade are sufficient raw materials, labor and capital, and the initial impulse to start the movement. That impulse, I believe, will be the agricultural activity. It is sure to have its effect on other industries. We must also remember that for five years nearly our entire productive capacity was devoted to war supplies and the enormous peace requirements of over a hundred million people were absolutely neglected. Are we not bound to feel, sooner or later, the accumulated demands of the railroads, house and industrial building, and the general replacement due to several years of ordinary wear and tear?

"The recovery of activity and the stabilization of prices are certain to be slower in some products than in others. Cotton and its products are usually prompt in recovering from business depression, because cotton is the clothing of the masses. On the other hand, steel continues to decline long after the bottom of a business depression is reached, because it is largely used in the construction of additional building and plant capacity. Such additions are not needed until general consumption increases enough to employ fully the existing capacity.

## American Leadership

"At every period one country more than any other represents the sentiment and the future of mankind. None will doubt that America occupies that place in the opinion of nations to-day. We are in these days settling for ourselves and our descendants questions which, as they shall be determined in one way or the other, will make for peace and prosperity or for calamity in the next generations. Settle them we will, and I am sure that we will settle them right.

"America is such a garden of plenty, such a magazine of power, that on her shores all the common dictates of political economy utterly fail. Here are bread and wealth and power and education for every man



ANDREW WHEELER

who has the indomitable will to use his opportunity.

"Courage, what a new face it puts on everything! 'A determined man,' said Emerson, 'by his very attitude and the tone of his voice puts a stop to defeat and begins to conquer. 'For they can conquer who believe they can.'" And we will conquer. For while the sky is pretty well clouded for the business men of to-day, and especially the steel and hardware jobbers, we proved our worth during the war and established our place as an essential factor in the industrial fabric. And when the sun shines again, which I hope and think will be soon, we shall forge ahead, better, stronger and more useful than ever."

#### Ex-President Taft on Taxation

A pleasant surprise came toward the end of the opening session when ex-President William Howard Taft was introduced to the convention. Mr. Taft was in Montreal as a member of the Grand Trunk Arbitration Board, and had yielded to the request of the convention officers that he come before his fellow-citizens assembled at the Windsor Hotel. He spoke briefly on taxation as now a matter of foremost concern to business men. If ever there was a motive for profiteering, he said, it was furnished by the taking of almost all the profits of men who are trying to carry on business. More than that, the possibility of taxation of capital frightens it into non-productive investments which do not tend toward business activity. Further, the over-taxation of business alarms merchants and leads them to wait and see.

Therefore, I should say the first thing that is necessary is a reasonable reduction of taxation. But, there are those who think that if you can only tax the rich man so that he is not rich, or so that he has to borrow money to pay his taxes and to pay his ordinary family expenses, why, somebody is getting the better of him. Well, you can read the lesson from it in the unemployment and in the other things that we have at home which do not make for general prosperity and a restoration to the normal.

Of course, we must be patient in the working out of the problem. We have an enormous cost of government, and it has to go on; but I venture to think that before we get through with the problem we shall reach the sensible conclusion that the cause for incurring this enormous burden was a cause which affects not only the present generation but affects advantageously many generations to come; and, therefore, it is fair that it should be divided between the present generation and the generations to come by funding it in long term securities, which shall transfer part of the burden to those who come after us.

One of the things we must realize in dealing with governmental matters—and it is the reason we ought to keep business as much as we can out of the government—is that governments move slowly, and all sorts of views have to be considered, and weighed. Ultimately, of course, the ordinary common sense of the American people asserts itself, but it sometimes takes an exasperating period to have it work itself through; at least it seems exasperating to us.

It is a good thing to have you come here. It is a good thing to cultivate relations with the Canadians. They are a responsive people. They have demonstrated their great capacity in the war, and they feel a new confidence in their power. They too have a great country. Their population, as compared with ours, is, of course, small—not more than seven or eight millions. They have a great many burdens to carry, but they are coming through, and coming through triumphantly. I am very confident, because I know something of the country; and one of the things we have to carry in our minds always is that the stronger and more prosperous the Canadians become, even from a mere selfish standpoint, the better for us. They are our nearest neighbors, and we should look with every degree of satisfaction on their growth to the greater things to which they are coming. I agree that temporarily there is a feeling of competition on both sides, possibly, but that in the long run amounts to nothing as compared with the business that two great peoples alongside are bound to do with each other.

The audience was quite captured by the eloquence of Hon. Job E. Hedges, New York, who spoke on "The Party of the Third Part in Business Contracts," bringing out the rights of the public in all industrial and business relations.

#### The Steel Jobber in Canadian Trade

T. M. Hutchison of Drummond, McCall & Co., Ltd., Montreal, read an interesting paper on "Some Aspects

of the Canadian Warehouse Business." In large part it is given below:

"There is, of course, a pronounced difference in the volume of demand between our respective countries. It may be conceded that a representative steel warehouse in the States will show an annual turnover some ten to fifteen times larger than that of a corresponding steel warehouse in Canada. You have in the States a consuming market of much vaster proportions than our own, which enables you to specialize in your warehouse lines to an extent which is scarcely possible in this country. Again, our geographical situation restricts us to a narrow territory stretching from the Atlantic to the Pacific, with no outlet to the south and with as yet no market to speak of in the north. The result of these conditions is that in the Province of Nova Scotia and New Brunswick there are no steel warehouses in your sense of the term and many consumers in these maritime provinces—1000 miles away—have to depend on Montreal for much of their emergency supplies. The steel warehouses of Hamilton and Toronto take care very adequately of the business of the Province of Ontario, but little is shipped by them or by the Montreal warehouses beyond Port Arthur at the head of Lake Superior. The requirements of our prairie provinces are well looked after by the steel warehouses in Winnipeg, while the Province of British Columbia draws its temporary supplies from the steel merchants of Vancouver.

#### Large Variety in Stocks

"Our main difficulty in Canada is the necessity of carrying stocks adequate and varied enough to satisfy a market one-tenth to one-fifteenth as large as your own, but which at the same time demands the same range of miscellaneous requirements. For example, a representative Canadian warehouse carries in stock to-day no less than 100 different sizes, qualities and thicknesses of sheared plates, in blue annealed sheets no less than 60 different sizes, and in black sheets no less than 50 different sizes. In cold drawn shafting, excluding strip steel, as many as 130 different sizes and lengths are kept in stock, while as regards boiler tubes no fewer than 126 different diameters, lengths and gages are found to be necessary in order to handle customers' requirements in a proper manner. Other lines will show much the same proportions. The necessary investment of capital is therefore very considerable in the case of a steel warehouse in this country attempting to handle its business along intelligent lines and aiming at rendering the best possible service to its customers. Again, we are operating some 500 miles or more away from the source of many of our supplies, necessitating larger stocks being carried than would be required were we within striking distance of the mills. Our margin for warehouse profit corresponds to your own, but against this our operating expenses may possibly be higher, owing to the greater distances over which it is necessary to look for business as well as to the great variety of our stocks.

"We have been blessed in this country since the days of confederation with a steady flow of sturdy settlers from Great Britain, many of whom were craftsmen. As time went on they called for the product which they were accustomed to use at home, and so a demand arose for Lowmoor bar iron and other well-known brands which has continued to the present time. Similar conditions prevail in the case of chain. We know of instances where Staffordshire iron chain continues to give good service in Canadian waters after 40 years of actual use, and there are many lumbermen in Canada who will have nothing else than British chain to-day. Spring steel is a further instance. Several consumers prefer the Sheffield made product to the spring steel of this country or of the States. It becomes, as you can see, an expensive matter for the merchant in this country to follow all these personal likes and dislikes, and to carry adequate stocks to satisfy every one.

"You are fortunate enough in being more or less self-contained in the States, and can manage very well

(Continued on page 1653)



# Central Purchasing Board Is Proposed

All Buying for the Government May Be Done  
by One Agency—Preparations for the In-  
auguration of the Budget System at Washington

—BY L. W. MOFFETT—

WASHINGTON, June 14,  
THE IRON AGE BUREAU,  
816 Fifteenth Street.

WITH the Government preparing to go on a new fiscal basis beginning July 1, as the result of the signing by President Harding of the budget bill last week, one of the first recommendations of the joint committee on executive reorganization is expected to call for the creation of a central board to make purchases for all branches of the Government. Representative Reavis, of Nebraska, pointing out that a selling agency is also contemplated, stated that these changes could be accomplished with little delay but that the proposed overhauling of the departments necessarily will be an extended process. He is of the opinion that millions will be saved if all supplies needed by the Government, including those for the Army and Navy, are bought through a single office. It will eliminate competitive bidding between the departments and will give an advantage in buying in large quantities. At present, practically all the departments and independent bureaus do their own buying, obtaining in many instances practically identical equipment and materials regardless of what other branches of the Government are doing.

It is also claimed that a centralized purchasing bureau will be helpful to manufacturing and other interests selling to the Government in that considerable red tape will be done away with. This, it is contended, will be brought about through a better standardization of specifications and an avoidance of making out forms that now are peculiar to given bureaus of the Government.

The underlying principle of the budgetary system, of course, is that it reorganizes the methods by which the Federal Government makes its enormous expenditures. A bureau of the budget is to be established in

the Treasury Department and a director of the budget will have charge of all estimates of the Government departments and agencies, and a comptroller general in charge of auditing expenditures will be at the head of the new bureau. Each will receive an annual salary of \$10,000. It is understood that the President will appoint the director and comptroller general before the new law becomes effective.

Provision is made that hereafter the various departments and bureaus of the Federal Government shall submit their annual estimates to the new bureau. A Federal budget covering all the branches of the Government is to be submitted to Congress at the beginning of each session. Provision is made to put an end to deficiency appropriations by requiring department heads to keep within the appropriations granted under the budget. While the new fiscal system is expected to result in much saving to the Government, the vast bulk of expenditures cannot be pared down to any considerable extent in view of the fact that costs of past wars and the maintenance of the military and naval establishments are estimated to require at least 85 per cent of the entire expenditures of the Government.

The joint committee on executive war organization held its first meeting yesterday to begin work on the reorganization of the departments. Walter B. Brown of Toledo, Ohio, named as a representative of President Harding to sit with the committee, was in attendance. It is understood that expert advice will be called in and the committee will make a thorough survey of all activities in which the Federal Government is engaged. The work of each department and independent office and its functions will be carefully analyzed.

## Probable Policy of U. S. Shipping Board

WASHINGTON, June 14.—Reorganization of the United States Shipping Board, including the fixing of a definite policy as to the upbuilding of the American Merchant Marine is to be undertaken at once now that President Harding has named the personnel of the board. It consists of Albert D. Lasker, a prominent Chicago advertising and business man as chairman; three other Republicans, Edward C. Plummer, of Maine, T. V. O'Connor, of Buffalo, and Meyer Lissner, of California; and three Democrats, former Senator George E. Chamberlain, of Oregon, Frederick I. Thompson, of Alabama, and Rear Admiral William S. Benson, of Georgia, who has been chairman of the board.

The President is scheduled to meet to-day with the new board, organized yesterday. The entire shipping situation is expected to be discussed. Mr. Harding is showing an intense interest in the matter. It is probably safe to assert that no question concerns the Chief Executive more than the Merchant Marine. He has always realized the import of this subject and is determined that a sound policy looking to the creation of a merchant marine shall be established and a fleet successfully operated under private ownership. No one appreciates more than he does that there are many problems to be solved.

After the fixing of a policy, the next step is expected to be the creation of a bureau of liquidation, looking to the taking of the United States Government out of the shipping business and the writing off of enormous losses and charging them to war costs. Completion

of this work, it is expected, will require several years. It is estimated that the merchant marine has represented an outlay of approximately \$3,000,000,000 and that in liquidating the fleet not more than \$750,000,000 could be realized to-day. It is estimated that the monthly deficit of the Shipping Board at present is approximately \$15,000,000, due partly to the depression in shipping circles which is world wide and not confined to the United States alone.

The Administration is plainly of the opinion that the Government should not compete with private industry and for that reason should dispose of its merchant fleet as quickly as possible. This also is the sentiment of Congress, as was shown by the passage of the Jones act at the previous session.

It is understood to be the desire of the Administration not only to have the merchant marine under private operation but at the same time to make commercial interests of the country more "ship-minded," in order that all interests will appreciate that an American merchant marine is absolutely essential to the country's economic stability and development. It is pointed out that efforts to build up foreign markets, which now are being intensified, will prove largely futile unless American producers are supplied with an American fleet instead of having to depend on foreign bottoms by which, as in the past, they would be subject to discriminations not only in tariff duties and freight rates, but in port regulations and other means that

(Continued on page 1659)

## Heavy Triple Geared Lathe

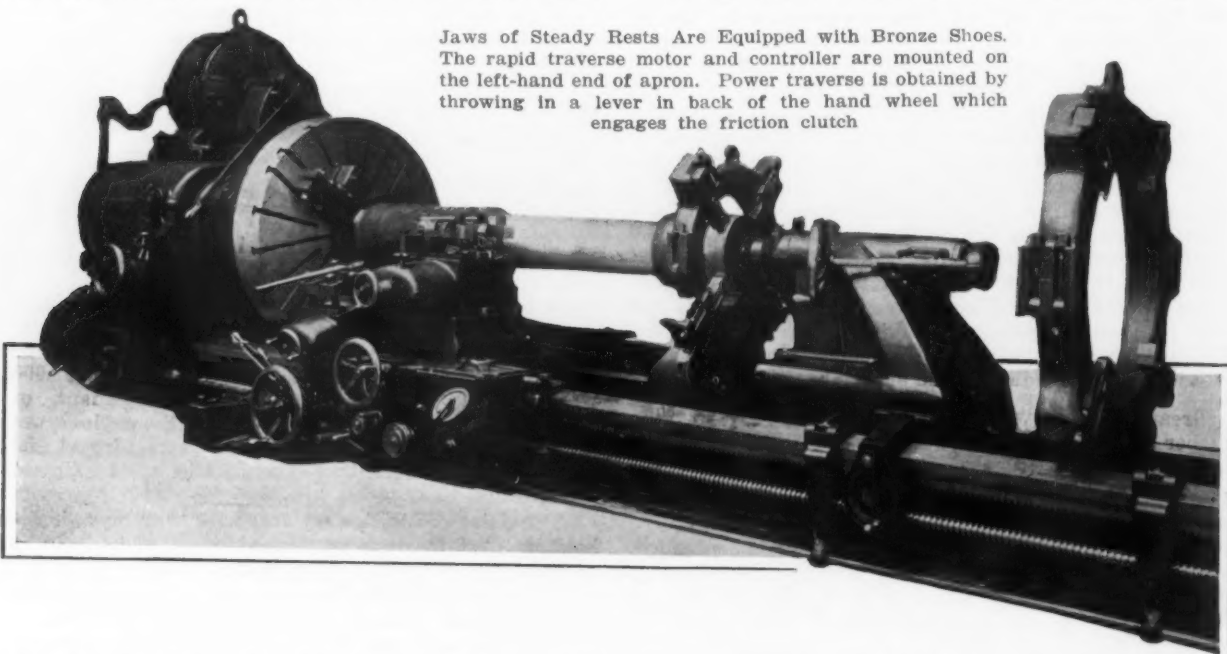
A 60-in. heavy triple-gear lathe having a 42-ft. bed made in one piece has been added to the line of heavy duty engine lathes offered by the Houston, Stanwood & Gamble Co., Cincinnati. A general view of the machine is shown in the accompanying illustration. The large steady rest has a capacity of from 23 to 37 in., and the smaller rest a capacity from 2 to 23 in. Both are fitted out with bronze shoes on the jaws. The carriage is equipped with power rapid traverse.

The patented support for the lead screw and controller rod is a unique feature, permitting of quick and convenient removal and replacement when it is desired to shift the support from one side of the tail stock bracket to the other side. The apron motor

the interlocking mechanism between the half nuts for screw and bevel feed gears and the large outer bearing of the rack pinion. The rack pinion and rack are of high carbon steel, heat treated, and have stub teeth with a 20 deg. pressure angle. The front and back wall portions of the apron are tongued and grooved through the center in male and female sections and also doweled and bolted. A positive angular tooth clutch made of 0.50 carbon steel drives the feed mechanism in the apron, a construction which allows the operator to engage or disengage instantly the feeds under heavy cuts without strain on his wrist or hand. The apron is also tongued and grooved to the carriage and the back wall is bolted to the carriage in the same manner as the front wall, therefore having no overhang on the apron.

Every lever on the lathe is a steel casting and

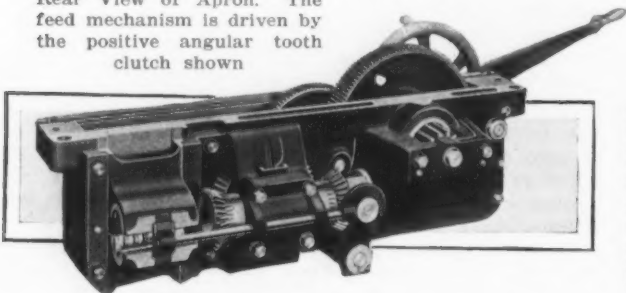
Jaws of Steady Rests Are Equipped with Bronze Shoes. The rapid traverse motor and controller are mounted on the left-hand end of apron. Power traverse is obtained by throwing in a lever in back of the hand wheel which engages the friction clutch



controller bracket and dial is mounted at the right of the apron, the controller bracket controlling the starting, stopping and reversing of the main motor. The action is transmitted through the horizontal shaft at the bottom of the lathe through chain and sprockets to the controller which is mounted on adjusting studs at the back of the lathe. The long ratchet lever at left hand end of the apron is used when it is desired to exert great power on hand adjustment of the carriage or used when feeding carriage under heavy cuts along the bed.

The rapid traverse motor and controller are

Rear View of Apron. The feed mechanism is driven by the positive angular tooth clutch shown



mounted on the left hand end of the apron and power traverse is obtained by throwing in a lever directly in back of the hand wheel which engages the friction clutch. Moving the lever towards the operator engages the positive clutch, allowing the carriage to be traversed by hand. The controller is constructed so that the operator must hold the handle in position while operating, as when it is released the handle springs back automatically to neutral.

The apron on a large lathe is a very important unit and is frequently one of the weak points. Special attention has been given it in this design. The accompanying illustration of rear of the apron shows

all gears are of 0.50 carbon steel. For the most part the gears in the headstock are stub tooth 20 deg. pressure angle. Lubrication of the headstock is by pump mounted at rear of the lathe and belted from the motor shaft. An oil gage is mounted on the headstock and an indicator placed in the line from the pump. The oil indicator has an aluminum pin wheel inside a bronze case and covered in front by glass. When oil is flowing the pin wheel spins.

The lathe shown is equipped with a 35 hp. Westinghouse type SK variable speed motor, 220 volts, direct current. The lathe on skids weighs 80,000 lb.

## British Iron and Steel Output in May

LONDON, ENGLAND, June 13 (By Cable).

Production of pig iron in Great Britain in May amounted to only 13,634 gross tons and that of steel ingots and castings was 5574 tons, compared with 60,300 tons of pig iron and 68,400 tons of steel in April, with 385,000 tons of pig iron and 357,600 tons of steel in March, with 463,600 tons of pig iron and 483,500 tons of steel in February and with 642,100 tons of pig iron and 493,400 tons of steel in January. The May figures also compare with a monthly output in 1920 of 667,325 tons of pig iron and 754,733 tons of steel. The extremely low level of production in April and May has been due to the lack of coal and coke because of the coal strike. The year's production to May 31 has been 1,565,134 tons of pig iron and 1,408,474 tons of steel ingots and castings.

Pear & Co., Inc., dealers in iron and steel scrap with headquarters at Reading, Pa., have opened a new yard at West Reading with sidings on the Philadelphia & Reading Railroad. It will be equipped for efficient handling of all grades of scrap iron and steel. The company recently added another steel derrick and an electric magnet in its Reading yard.



# Evolution in French Iron and Steel

What Consolidations the Post-War Problems Have Effectuated—Efforts Now Tending Toward Concentration in Selling

BY JOSEPH F. SHADGEN\*

PEACE for France brought the great double task of the rebuilding of destroyed factories and the demobilization of plants built under the pressure of the national defense in locations often badly suited for after-war trade. While very few blast furnaces had been built during the war on account of the difficulties of the coke supply (two at Caen, one at Rouen, one located in the Lyons district and several old or abandoned plants refitted), the capacity of the steel plants was increased considerably and several big new open-hearth plants were built, while the electric steel industry made gigantic progress, especially in the Alps region. The reconstruction became a national problem and projects for national co-ordination were worked out, recommending standardization of products and specialization of manufacturing plants to bring down production costs and create sound economic conditions.

## Standardization and Specialization

Great progress was made by the reduction of the number of standard rolled sections. For rails, for instance, five standard sizes were adopted by all roads for full-gage service and a much greater co-ordination of the other shapes is in the hands of the standardization *comité* and technical societies. A step in national co-ordination was made by the foundation of industrial groups of large size with several factories. Friendly understanding among independent companies, like Micheville and Homécourt, led to a compensating program of reconstruction for their two destroyed plants in the Meurthe-Moselle district.

While it is accepted by engineers that 500,000-ton per year plants are the most desirable mixed units (blast-furnace, steel-converters, rolling mills), the superabundance of productive capacity caused by the addition of the Lorraine plants brought commercial considerations to the foreground, and the economists together with the Government experts decided that it would be advisable to rebuild the devastated plants and factories to pre-war productivity *without extension* and to devote more attention to detail equipment to solve the dual aim of saving in cost of installation and securing lowest operating expense.

All new construction was discouraged for the same reason, as the financial experts realized that the digestion of the actual capacity is difficult enough and it is probable that new projects for increased developments will find a deaf ear for quite some time. This moderation is highly commendable and reflects both the commercial sagacity of the leaders and the national co-operation of the whole industry. In spite of the heavy wounds of France this spirit will certainly yield surprising results and hasten the economic recovery of that nation.

The gigantic task of reconstruction could only be solved by subordination to national utility and logical preference. Therefore it is explainable that railroad lines and highways and streets and canals were restored first, as no normal industrial activity is possible with broken down arteries of transportation. The iron and steel plants are still far from being rebuilt and it will take quite some time before they are completed, as these highly specialized plants, requiring besides cement, bricks and fillings for foundations; steel work, roofing and gutters for buildings; machines, motors and heavy steel castings for equipment, cannot possibly be refitted in two years. From the technical standpoint it is interesting to mention the new con-

struction of modern coke oven batteries in Lorraine (Pont-à-Mousson, Homécourt and Neuves-Maisons) far away from the coal field to permit a utilization of the by-product tar and surplus gas.

## Financial Developments

The greatest evolution is noticeable from the financial-commercial standpoints. The economic principle of integration, combining independent enterprises into large well balanced units, played an important role in the shaping of the post war settings. At the outset circumstances forced most of the companies to modernize their organizations by incorporating. Mining enterprises like Aniche, Bethune, and Lens had been operating for over 100 years and were abnormally under-capitalized as it had been their conservative policy to finance their technical extensions and plant enlargements out of the yearly earnings. Aniche increased its capital to 160,000,000 fr., Mines de Lens to 200,000,000 fr., Blanzey to about 125,000,000 fr., etc. Fusion of different concessions occurred, like Vicoigne-Noeux et Drocourt, consolidating pits with all grades of coal and large outputs to strengthen the commercial footing of their common interests and to permit easier financing of the large reconstruction program. The reserves and surplus built up by these three mines are invested in chemical and dye companies, in power plants and shipyards, which gives them a great financial resiliency. These money transactions were necessary to bring the capitalization in proportion to the war claims for real destruction and actual cost for rebuilding and mark a new phase in the financial policy of these great French companies.

The iron and steel industry, closely related to the coal interests by reason of fuel and coke supply, developed similarly, but the individual enterprises were added to their organizations by the affiliation of independent companies with correlated product to secure the raw material supply as well as the sale of semi-finished products. This movement produced the slow evolution into industrial groups in which the originating and controlling company functions as bank and clearing house as much as guiding commercial spirit and technical adviser. The most important industrial factions are Schneider-Creusot, Marine-Homécourt, de Wendel, Dreux-Longwy, Decazeville; Nord & Est, Neuves-Maisons, Denain-Anzini Pont-à-Mousson and Senelle-Maubeuge.

## Marine-Homécourt-Micheville Group

To illustrate the diversification of interest and the enormous integration centering in these companies the history of Marine-Homécourt may be recalled. This enterprise, started in 1818 as a forging plant with a steam hammer—Atelier Petin and Gaudet, in St. Chamond—developed into steel making plants along the river Gier known for its quality products of military nature and built later the Boucau division and consolidated around 1900 with the Homécourt blast furnaces and steel converters located on the Lorraine ore field. This combination secured a one-third interest in the German mine Charlemagne near Aachen (coke supply) and controls the coal mines of St. Chamond, is a shareholder in the Beeringen concession in the new Belgian Campine field and has licenses around Lyons, France. Ore lands in Lorraine are owned and controlled to guarantee reserves for years to come, hydro-electric enterprises have been developed by the allied Basse-Isere and Avelard companies, making ferroalloys and cyanimid products. To facilitate the sale of its ingots,

\*Consulting engineer, New York.

the Hautmont factory was acquired, the Gennevilliers shops were built and the Etablissements Teste of Lyons were associated. An alliance was effected with the Swiss firm of Sulzer Brothers to get control of their St. Denis shops, building steam, gas and Diesel engines, and several electrical equipment enterprises were absorbed.

Last year two large railroad repair shops were taken over from the Paris-Lyons-Mediterranean and the Orleans companies to enter the car and locomotive fields and the Société des Tubes de Vincay (30,000,000 fr.) was incorporated in 1918 in conjunction with the Compagnie d'Electricité. Add to those transactions an understanding with the independent Micheville enterprise, and the Homécourt and Villerupt plants, of 350,000 tons capacity, each rolling compensating, now competitive products, are virtually fused in spite of the official financial independence.

#### Dreux-Longwy Group

The Acieries de Longwy expanded similarly under the leadership of Alex Dreux. The start was a lonely small blast furnace of about 60 to 80 tons daily capacity in Mont-St. Martin, built in 1863 on an iron mine. It developed gradually into a steel plant with blast furnaces, Thomas converters, and extensive rolling mills producing over 400,000 tons of steel products. Longwy acquired 50 per cent of the coal company Karl-Alexander of Aachen, 14 per cent of the Fresnicourt Mines, 33 per cent of Faulquemont concession, and fathered the Sluiskill (Holland) and Auby coke plants. Its ore holdings cover over 10,000 acres. The down stream developments to conquer markets started with an alliance with the wire works of Gorcy located nearby, and caused the building of the shops of St. Denis and Aubervilliers in Paris and the Venissieux (Rhône) factory to enter the railroad repair and supply business. The Forges de Sedan were absorbed to secure a hold in the sheet and tin plate market and the destinies of the Ateliers de construction du Nord with large holdings in several Belgian and French tram-cars and locomotive construction factories were secured by majority share-control. The weak Forges de Recquignies were invigorated and consolidated with the Hautmont Tube Co. to get a foothold in the pipe and tube business; and the Sud-Ouest shipyards were acquired, etc. Recquignies-Hautmont became allied last year with the Louvroil tube works and formed the Société Française des Tubes de la Sarre to acquire the Mannesmann works in Bouss and Sarrebrücken. This new French enterprise, which also has the financial support of Marine-Homécourt, is incorporated with a capital of 50,000,000 francs, of which the German interest received 40 per cent of the shares as payment for their assets, with the privilege of naming two of the five controlling directors.

#### Acquisition of Lorraine Plants

The German built and owned plants of Lorraine were put under alien property control by the French as soon as the armies entered that part right after the Armistice. The need of absorption of these properties brought about the interconnection of the French industrial groups by common participation in the share control of the new companies formed to take them over. The tendency toward friendly understandings began as far back as 1912 with the construction of the Hauts-Fourneaux de Rouen to supply ferroalloys, especially spiegel-eisen and ferromanganese. It further developed by the reorganization of the Caen company, originated by the Le-Chatelier-Cail interests and August Thyssen of Muhlheim-Ruhr, to develop the Normandy ore field. The Société Normande de Metallurgie was formed in 1918 to push the half-finished work and to turn this liability into an asset for the national defense under the leadership of Schneider-Creusot, but with the other leaders as partners.

The date of sale of the German owned properties was Oct. 18, 1919, and a résumé may recall the various transactions and their later transformations.

1. *Rombacher Huttenwerke* with the following assets:

a. Ore mines of Rosselange, Vitry, St. Paul, Willkœmmen Orne, Pauline, Grenza Ste. Marie, Prince August; production in 1913, 2,077,000 tons.

b. Rombas works: 8 blast furnaces of 200 tons, 6 Thomas converters of 22 tons, 4 open-hearth furnaces of 20 tons capacity; 2 blooming mills, 3 duo-reversing mills, 1 Sack mill for wide flanged girders, 3 three-high mills, 1 wire mill, a central power plant (24,000 hp.), brick works, etc.

c. Maizières works: 4 blast furnaces of 180 tons, 1 central power plant (10,000 hp.).

d. Railroads, aerial transport lines, workman houses, etc.; 1913, 760,000 tons of pig iron, 590,000 tons of steel. Acquired by Marine-Homécourt, Micheville and Pont-a-Mousson interests that had formed a special company, Société d'Etudes et d'Entreprises Industrielles; valuation 125,000,000 f. The corporation was changed later to Société Lorraine des Acieries de Rombas with 150,000,000 f. capital (20 per cent Marine).

2. *Thyssen-Hagondange*: A modern plant built in 1912-13; 6 blast furnaces of 250 to 300 tons; 5 Thomas converters of 30 tons; 2 open-hearth furnaces of 60 and 80 tons; 2 mixers of 700 and 1000 tons; 3 electric furnaces, 20 and 8 tons capacity, 1 central power plant, 40,000 hp.; 38-in. blooming mills, 34-in. reversing mills; 2 continuous mills, 1 cement plant; mine properties, Jacobus Ste. Marine-Aux-Chènes Pierrevilliers, Blonvaux, Hercules, etc.; capacity 600,000 tons of pig iron, 500,000 tons of steel. Sold to Hauts-Fourneaux et Acieries d'Hagondange for 150,000,000 fr. The shares of this stock company are in the hands of the Groupement des Consommateurs de Produits Metallurgiques, an association of 400 users of steel products participating in proportion to their consumption and headed by the automobile factories (some 10 or 12 enterprises), the engineering works (Fives-Lille, Alsacienne, Bessoneau) and Japy-Freres through the Acieries de Beaurort, etc.

3. *Lothringer Hütten und Bergwerke A. G.* A mixed German-Belgian enterprise but controlled by Berlin banks with three blast furnaces (180 tons) at Fentoy, 7 at Knutange (200 tons), 6 Thomas converters of 20 tons, rolling mills, central power plant, aerial transport for ores; capacity of 500,000 tons by pig iron and over 400,000 tons of rolled products sold to Participation Minière et Metallurgique d'Alsace-Lorraine for 107,400,000 fr. This company was reorganized in 1920 and took the title Société Metallurgique de Knutange with 75,000,000 fr. capital and 75,000,000 fr. 5½ per cent bonded debt subscribed by Schneider-Creusot, de Wendel, Neuves-Maisons, Denain & Anzin and Senelle-Maubeuge.

4. *Carlshütte of Thionville* controlled by the Roehling Brothers of the Saar with 4 blast furnaces (200 tons), brick plant, limestone quarries and important ore lands taken over by Société Lorraine Minière et Metallurgique with an incorporated capital of 50,000,000 fr. of which Dreux-Longwy controls alone 33 per cent.

5. *Hauts-Fourneaux d'Audin-le-Tiche*, part of the powerful Gelsenkirchener Bergwerke A. G., made up of mines, pit heads, 4 blast furnaces of 180 and 200 tons daily capacity, a large power plant, a complete city of workman's houses, etc. The Syndicat de l'Algette, a French-Belgian combine, took over these properties, estimated at 38,500,000 fr. The 55 per cent French participation was subscribed by Schneider, de Wendel, Denain-Anzin and Neuves-Maisons. In the final organization this company took the name of Société Minière des Terres Rouges (20,000,000 fr. capital, 20,000,000 fr. bonded debts), closely allied to the large company which took over the properties of the Gelsenkirchen company located in the Grand Duchy of Luxembourg and in the Aachen district. The controlling French interests are the same that bought the Fentoy and Knutange works of Lothringen group.

6. *Dillinger Huttenwerke*. This was a Saar interest of long standing that owned an important steel plant in Dillingen (Saar) and blast furnaces in Redange (Lorraine). The sale of this property was delayed on account of the complication arising from the political status of the Saar and only in the middle of 1920 was the Société Française de Redange-Dilling formed with 36,000,000 fr. capital under the leadership of Marine-Homécourt (20 per cent participation).

7. *The Uckange properties*, belonging to the Stumm family originating from the Saar district. In Lorraine are located the blast furnaces of Uckange (200,000 tons per year) and numerous ore concessions, Ida, Neunkirchen Boulange, Halberg, Châtel, etc., while Neunkirchen in the Saar region was the site of the main works and large steel plants with rolling mills and fabricating shops, etc. The allotment of the Lorraine properties was postponed in an effort to induce the German owners to sell the complete aggregate including the Saar plants. After considerable negotiations in which the Banque de Paris, et des Pays-Bas was guiding spirit, an understanding was reached with the Stumm Brothers to form a new company, the Forges et Acieries de Nord et Lorraine, of which Stumm remains a 40 per cent shareholder and of which the 60 per cent remaining were subscribed by a consortium of steel interests headed by the Nord et Est group.

(Continued on page 1656)



# Calls Corporation Answer a Smoke Screen

Pittsburgh Plus Condemned at Meeting of Chicago Purchasing Agents' Association — Resolution Adopted

**"T**HE answer of the United States Steel Corporation, pleading the decision of the Supreme Court in the dissolution suit brought against it, as a defense to the complaint of the Federal Trade Commission, is nothing more or less than a smoke screen," declared H. G. Pickering, counsel for the Western Association of Rolled Steel Consumers, in addressing a meeting of the Purchasing Agents' Association of Chicago, at Hotel Sherman, Chicago, on June 9. Others who spoke in opposition to "Pittsburgh plus" were W. L. Chandler, president National Association of Purchasing Agents, and H. A. Wagner, president the Wisconsin Bridge & Iron Co., Milwaukee, and a director of the Western Association of Rolled Steel Consumers. At the conclusion of the meeting a resolution was unanimously adopted, asking the Federal Trade Commission to hold one or more hearings in its investigation of the Pittsburgh base case in the city of Chicago.

## Inconsistency Charged

Referring again to the corporation answer in the course of his remarks before the purchasing agents, Mr. Pickering said:

"The corporation in its answer boldly asserts that it costs more to make steel in Chicago than in Pittsburgh (although Mr. Gary has said that it costs less), but not as much more as \$7.60 a ton, and that while they make larger profits on the steel made at Chicago than on the steel made at Pittsburgh because they get this \$7.60 per ton, they have a perfect right to do so, the Federal Trade Commission has no authority to interfere, and the people of Illinois have no complaint.

"Steel, with other commodities, is gradually going down in price. The plus which Illinois steel carries still stays at \$7.60, and every time the steel market drops the percentage of discrimination in cost under which the Illinois manufacturer labors as against his Eastern competitor is increased."

Touching upon the decision of the United States Supreme Court in the dissolution suit, Mr. Pickering declared: "The Supreme Court did not license the United States Steel Corporation to indulge in price discriminations. It did not authorize the corporation to collect from consumers outside of Pittsburgh an unreasonable surcharge upon steel products under the guise of a freight charge which is not incurred and which is never paid to the railroad. Pittsburgh plus was not tried before the Supreme Court in the dissolution suit, or any other proceeding. The people of Illinois and the West will not be content with the decision of the United States Steel Corporation to the effect that it is lawful to discriminate against them. On that point they prefer a decision of the United States Supreme Court and they will not rest until they get it. And if by any chance the Supreme Court should finally say that the Clayton act does not reach a discrimination such as this—which event we do not believe to be within the range of possibility—the people of Illinois and the West will not rest until Congress has amended the law so as to protect them in their natural trade rights."

## Buyer Not in Control

Mr. Pickering pointed out that an incidental feature of the Pittsburgh plus practice was that it gave the buyer no title or control over steel purchased until its delivery and nothing whatsoever to say about its routing or shipment. On this point he said: "It might be highly desirable for you to say where and how the steel should be shipped. It might be desirable to trade traffic for business with some railroad company. Perhaps you could ship by truck, or under a favorable

charter party with some steamship company. I notice in the answer of the United States Steel Corporation it is alleged that you may do these things; well, try it. You will find the fact to be, buy your steel where you will and from whom you will, that you can only buy it for a delivered price at your plant, which includes the freight from Pittsburgh, and the mill will very generously relieve you from any of the troubles, difficulties, and irritations of routing and shipment."

## Effect on Fabricators

In demonstrating the effect of the Pittsburgh basic point upon Chicago fabricators, Mr. Pickering showed a map of the United States, a small area of which in some of the Western States was colored yellow. In this territory the through rate on steel from Pittsburgh is equal to the sum of the local rates from Pittsburgh to Chicago and Chicago to destination. For delivery in this yellow territory, the Pittsburgh fabricator buys his steel at the market price at Pittsburgh, fabricates it and lays it down on the job, for exactly the same cost that the Chicago fabricator can buy his steel in Chicago, fabricate and ship it to destination. In all of the territory outside of this small area, in other words, in by far the larger part of the United States, the through rate from Pittsburgh is less than the sum of the two local freights, Pittsburgh to Chicago, and Chicago to destination. In Indiana, Michigan, or western Ohio, parts of the country which are closer to Chicago fabricators and should be their legitimate field of business, the Chicago fabricator not only pays the freight from Pittsburgh to Chicago, but the freight back East to the job, whereas the competitor only pays the freight on the finished product from Pittsburgh to destination, which, of course, is less than the arbitrary plus charge constituting the imaginary freight from Pittsburgh to Chicago. "In short," said Mr. Pickering, "your steel costs you so much at Chicago that you cannot go a mile east of your plant and compete with the Pittsburgh fabricator, who gets his steel for \$7.60 per ton less than you pay for it." "The practice of adding Pittsburgh plus," asserted Mr. Pickering, "has been followed uniformly by every steel mill in the country for practically 20 years. . . . We have produced typical invoices and contracts for many different years before the commission, and challenged the mills to produce those which showed a variation. They were not produced. . . . More than that—not only has the practice been uniform on the part of all mills during the 20 years, but day by day through that period the price has been uniform, except for two periods of brief duration in 1908 and 1909 and in the latter part of 1920 and the first part of the present year, both being periods of general commercial depression."

## Price Variations

Mr. Pickering stated that no written evidence of price variations had been offered by the mills before the Federal Trade Commission and that in this connection he and his associates in counsel had addressed the mills as follows: "There has perhaps been some price variation, but we venture to assert that such variation as you can show will fall into either one of two classes. Either they will be so small and so much less than the freight differential which you add on to the price as to fall far short of anything like a competitive price, or they will be so large and of such rare occurrence that, in view of the statutory prohibitions against discrimination, you would do well to say little about them."

Mr. Pickering admitted that this might strike one as something of a paradox. On the one hand it is charged that uniformity of price evidences collusion,

agreement and lack of competition, and in the same breath that differences in price are non-competitive and discriminatory. "That is a fair question to raise and it really gets down to the crux of the whole matter," said Mr. Pickering. "What is a competitive price and is there price competition in the steel trade?"

#### Flush and Lean Times

"Trade in any commodity must pass successively through flush times and lean times," he said. "When the supply of a commodity is low and the demand comparatively large, the price will go up and up and up to the point where the buyer who needs the commodity most says: 'I will pay so much and no more.' When there is a large supply of a commodity and a lesser demand, the price of the commodity will go down and down and down to the point where the buyer who needs the commodity least says: 'I will pay so much.' Of course, all producers of a commodity do not have the same cost. Some plants are more efficient than others, some are more advantageously located than others, and for other reasons, various cost levels must necessarily exist. In this long range of prices which a commodity will bring, there is a point where the price brings an amount of money which just about covers the cost of the high cost producer. If the price should fall below that, this producer must either reorganize his business, find some method at least of reducing his cost, or take his product off the market and go out of business. This man is known as the marginal producer. In the trade in any commodity in which real competition exists there is always a marginal producer, and the tendency of the price over an extended period of time, each competitor bidding for the business, is down toward the marginal cost. That is competition and competitive price.

#### The Low Cost Producer

"No such thing as this exists in the steel trade and the practice of Pittsburgh plus is the device which maintains the price of steel at so high a level that the high cost producer can compete anywhere in the United States with the low cost producer and is never in danger of going out of business or taking his product off the market. An examination of actual conditions shows that the high cost steel mill, the mill which does not own a ton of iron ore, which does not own a ton of coal, limestone or other raw material, but which buys its billets and re-rolls them into commercial shapes, can sell its steel in competition with the low cost mill anywhere in the United States.

"This can be conclusively established by two facts. One of these facts is that a high cost mill located in a territory where it can and does collect the artificial freight charge on top of the market price of steel will be found, to a considerable extent, shipping its product back into a territory where the actual freight charge which it must absorb takes up a part or all, or more than the plus, with the result that the net return to the mill is less than the return on sales made in the territory where the full freight differential can be collected.

#### Action of War Industries Board

"The fact was also authoritatively established when the War Industries Board took action with respect to the Pittsburgh base. During the war when tremendous production was required at any price, both Eastern and Western factories were taxed to the limit of their capacities. The Government was paying for everything on the basis of cost plus and the Government discovered that the artificial freight rate from Pittsburgh to Western points was a very considerable part of the cost of the materials which it required. The Navy refused to pay on the basis of Pittsburgh plus and the Railroad Administration questioned it. Thereupon the War Industries Board established a Chicago base which was in effect for several months and was then abolished. In abolishing it, Mr. Replogel wrote a letter of explanation in which it was said that it had been found that there were certain high cost steel mills which could not survive if the arbitrary freight differential which they were permitted to add to the market price under the Pittsburgh plus arrangement were taken away."

Continuing in this vein, Mr. Pickering said: "As a matter of fact, the condition which exists is the establishment of so high a level of prices for rolled steel as to permit of a pseudo competition within the figures of the arbitrary surcharge which does not have the effect of competition at all and which does not relieve you from the discriminations under which you operate, as against your Eastern competitors."

#### Says Plus Practice Is Unsound

"The safest and surest method of detecting error is multiplication," said W. L. Chandler, president National Association of Purchasing Agents, addressing the meeting. "Any error if multiplied a thousand fold will very quickly stand out in bold relief. Applying this test to the Pittsburgh plus proposition, we may ask ourselves how the business world would favor a plan of sales and purchase, whereby 1000 of the principal commodities bought and sold in the daily markets were to be handled upon a plus basis. In other words, if everything we bought was to be handled upon a similar plan, selecting some basing point for the cost of the material, adding to that price the cost of freight from basing point to point of consumption, requiring all customers to pay that freight independently of the cost of production and without regard as to whether the goods bought were shipped 3000 miles or 3000 feet from point of manufacture, we should soon discover that we were on a basis contrary to the best interest of both buyer and seller. It seems perfectly clear that the basing point, plus the plan of doing business, cannot stand the acid test of multiplying by 1000. This confirms a widespread belief among the purchasing profession that the practice is fundamentally and economically unsound, and therefore should be abolished entirely from the business practices of our country. The opposition of the National Association of Purchasing Agents to this practice rests entirely upon the fact that it is unsound and that it is discriminatory as it is applied."

H. A. Wagner, president Wisconsin Bridge & Iron Co., Milwaukee, recited a number of his own experiences to indicate how Pittsburgh plus works to the disadvantage of Western fabricators and illustrated in particular how relentlessly mills have insisted upon the Pittsburgh to Chicago freight charge. Last summer his company was bidding on a bridge to be erected north of Chicago. As is customary in fabricating trade, a lump sum bid was made, without any reservations as to changes in prices. Shortly thereafter, increased freight rates went into effect and in anticipation of this event, he asked the various steel mills if they would not waive the increase in freight from Pittsburgh to Chicago and merely charge the actual freight increase from Chicago to point of destination. Yet not a single mill would comply with this request. Thus the mill, and not the railroads, got \$4,500 more from his company as a result of the advance in rates.

#### Electric Pig Iron in Brazil

The Companhia Electro Metallurgica Brasileira and the Batcheller-McConnel Co., New York, have recently acquired from Frank Hodson, president Electric Furnace Construction Co., Philadelphia, and his Swedish associates, the exclusive rights and licenses for Brazil for the Grönwall type "Electrometall" electric shaft smelting furnace. Two large furnaces, each of 3000 kw. capacity, are at present being installed by the Brazilian company and it is probable a number of others will follow the original installation. In Europe this type of furnace has been in successful operation for some years and of 27 furnaces installed in Sweden, Norway, Italy, Japan, etc., the total power capacity is no less than 99,700 kw. Frank Hodson, who is closely connected with the development of the Electrometall smelting furnace, states that a large Western corporation will probably put in the first installation in the United States, and further states that several very large electric pig iron smelting installations will be proceeded with immediately general business conditions improve.



## PITTSBURGH BASE HEARINGS

### Federal Trade Commission Will Take Time to Study the Evidence

WASHINGTON, July 14.—Hearings in the so-called Pittsburgh-plus case by the Federal Trade Commission will not begin before late in July or early in August, according to present plans of the commission. Deferring of proceedings for such an extended period is due to desire of the commission to formulate its case, which, it realizes, will require considerable study, based upon the evidence previously produced, together with the reply of the United States Steel Corporation to the complaint of the commission. Numerous points including the most fundamental are in dispute between the commission and the Steel Corporation and will involve much investigation preliminary to the hearing and this will be undertaken by the commission with a view to informing itself as fully as possible before entering upon a formal examination through hearings.

Such matters as costs of production, consumption, supply and demand in given steel centers, together with selection of proper witnesses who it is considered will be best qualified to pass upon the subjects, are to be taken into account by the commission and developed as thoroughly as is possible. So far as costs are concerned, it is pointed out, the commission may not succeed in obtaining all the data it desires, but it is recalled that the Steel Corporation several years ago voluntarily submitted cost figures to the commission and only stopped doing so when asked by the commission itself to cease. This came about as the result of a dispute with independent steel interests, along with coal operators and others, in which it was contended the commission had no right to ascertain cost figures. It was stopped from gathering figures by injunction and efforts now are being made by the commission to vacate an injunction granted in the so-called Claire Furnace Co. case by the Supreme Court of the District of Columbia, restraining the commission from obtaining cost figures.

#### Arguments Postponed

It was expected that this injunction proceeding would be argued this month before the District Supreme Court, but conferences have been held between the chief counsel of the commission and counsel for independent iron and steel interests which have led to postponing of the arguments. This was apparently due to the fact that the commission concluded it did not have a sufficiently strong case upon which to base arguments. Consequently, it has prepared to begin to take testimony some time this fall, as now proposed, from the affected independent iron and steel interests preparatory to arranging for its arguments to have the injunction set aside. This testimony will revolve about points made by independents as reasons for not submitting cost figures, one of which was that the cost of preparing such data would be prohibitive. The claim is made in addition to the one that the commission does not have the power to gather such figures and can obtain them only through voluntary action, such as was performed by the Steel Corporation. There likewise is a difference between the commission and iron and steel producers, as well as others who have declined to give cost figures, as to the manner of accounting, such as those relating to capital account, depletion in case of coal mines, and depreciation. It is evident also that one of the underlying reasons of some interests in refusing to submit cost figures is that they will be used as an entering wedge looking toward price regulation of industries of the country by the Federal Trade Commission, a fact which the latter body denies strongly.

#### Attitude of Independents

Contrary to original expectations, there is no indication now that independent steel interests will intervene on the side of the Steel Corporation in the Pittsburgh-plus case. Should they do so, however, it seems plain that the commission, if it sought cost data, would find itself unable to obtain the information from

the independents, at least while the injunction mentioned remains in force. Whether the commission will avail itself of cost figures submitted by the Steel Corporation is not known. The item of cost will prove an important one in view of the fact that the Steel Corporation answer denies that steel is manufactured in either Chicago or Birmingham more cheaply than in Pittsburgh. Differences of opinion as to supplies of raw materials, and production of iron and steel controlled by the Steel Corporation will call for study by the commission, though they are accepted as of comparatively little importance inasmuch as obviously the corporation is informed on these subjects whereas the commission apparently is not, but has various records, aside from the corporation, to refer to for facts. Proceedings in the dissolution suit against the corporation were replete with data of this character.

### Refractories Market Untested

PITTSBURGH, June 13.—Demand for refractories reflects closely the downward slant of iron and steel works operations and while there has been no important change in prices since last reports, this must not be construed as evidence of steadiness, but rather is due to the fact that there have been no inquiries up of a size to really test the market. It is more than probable that the appearance of orders of what ordinarily would be considered moderate would produce some shading of quotations on fire clay brick and the recent reductions in silica brick prices seem to have been utterly without effect upon the demand, although the reduction was the result of competition between some of the Eastern manufacturers on an order which was up at the time. Chrome brick can be bought as low as \$60 per net ton and magnesite brick as low as \$70 per net ton in the standard sizes, or \$5 per ton below the recent quotations. The market briefly may be described as generally dull, nominal and untested.

There is no disposition on the part of manufacturers to produce against future demands at current costs and a good many plants in the several producing sections are entirely shut down. It is doubtful whether as much as 20 per cent of the capacity to-day is in operation. Some manufacturers have a stock sufficient to take care of the normal requirements of their regular customers for about a month, but this is not true in all cases and because manufacturers' stocks generally are moderate improvement in the iron and steel industry would cause early exhaustion of these stocks. Most of the Steel Corporation plants have fair-sized stocks, but among the independents, the situation is practically the reverse.

We quote per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania .....	\$36.00 to \$43.00	\$20.00 to \$36.00
Ohio .....	36.00 to 40.00	20.00 to 35.00
Kentucky .....	36.00 to 40.00	24.00 to 38.00
Illinois .....	40.00 to 45.00	20.00 to 40.00
Missouri .....	45.00 to 50.00	35.00 to 40.00
Silica Brick:		
Pennsylvania .....		25.00 to 40.00
Chicago .....		42.00 to 45.00
Birmingham .....		46.00 to 50.00
Magnesite Brick:		
Standard size, per net ton.....		70.00 to 75.00
Chrome Brick:		
Standard size, per net ton.....		60.00 to 65.00

In connection with a field day for the benefit of the Watertown Arsenal Mutual Relief Association, the Watertown Arsenal, Watertown, Mass., for the first time in 105 years, was open to the general public Saturday afternoon, June 11, for a demonstration of the processes used in the manufacture of big guns. In addition there were exhibits of forgings, castings and assemblings.

The Franklin Institute of the State of Pennsylvania, acting through its committee on science and the arts, investigating the jet entraining apparatus of the Surface Combustion Co., industrial furnace engineer and manufacturer, has awarded to the inventor, W. Barton Eddison, the Edward Longstreth medal of merit.

## CUTLERY STEEL STOCKS

Warehouse of Wetherell Brothers Co., at Cambridge, Mass.—Handling Facilities Ample

**N**OTWITHSTANDING the fact that most of its business is in materials shipped direct from the mills, the stock carried by Wetherell Brothers Co. in its Cambridge, Mass., warehouse approximates 2000 tons of special steels and steel wire. The position of the firm in the cutlery field is especially strong, supplying, as it does, a large percentage of the steel consumed annually by the cutlery manufacturers of New England.

In the warehouse, which is two-stories, 100 x 100 ft., are a main storage space approximately 71 x 100 ft., a shipper's office 28 x 16 ft., a boiler room, 16 x 14 ft. for furnishing heat and hot water for the main office and wire storage department, a laboratory 14 x 22 ft., and a wire storage department 28 x 67 ft., out of which stairs lead to the executive offices, 28 x 100 ft., on the second floor. The latter include the treasurer's and the president's private offices, each 12 x 15 ft., a counting room 67 x 28 ft., a salesmen's room 12 x 15 ft., and a ladies' rest room 14 x 15 ft., as well as toilets.

Wooden upright and iron crossbar racks for stocking bar material are provided on the north and south sides of the main storage department. On the north side are eight racks occupying approximately 67 x 13 ft. floor space, with proper space between them and the plant wall to allow for natural light. Sufficient room is left on one end of these racks for sizes too heavy for racking, such as shafting, and on the other end, for La Belle open-hearth 0.60 per cent carbon annealed die blocks, in quantities, which are supplied to cutlery manufacturing and drop forge concerns throughout New England. In these eight racks are stocked the various grades of steel handled, each kind of material being properly labeled in its respective rack section.

In the center of the warehouse proper is ample space for required machinery and for the temporary storage of a large tonnage of stainless steel rounds, sheets and double bevel, as well as annealed tool steel sheets such as are used in the manufacture of pocket knife blades and metal slitting saws, together with sheet spring steel for oil hardening, pickled and limed,

annealed black spring sheets, bolster steel sheets, and boxed and loose cold rolled strip steel, etc. A wide passageway for trucks and wagons is left on both sides of this storage space, and between the storage racks on the north and south sides of the plant.

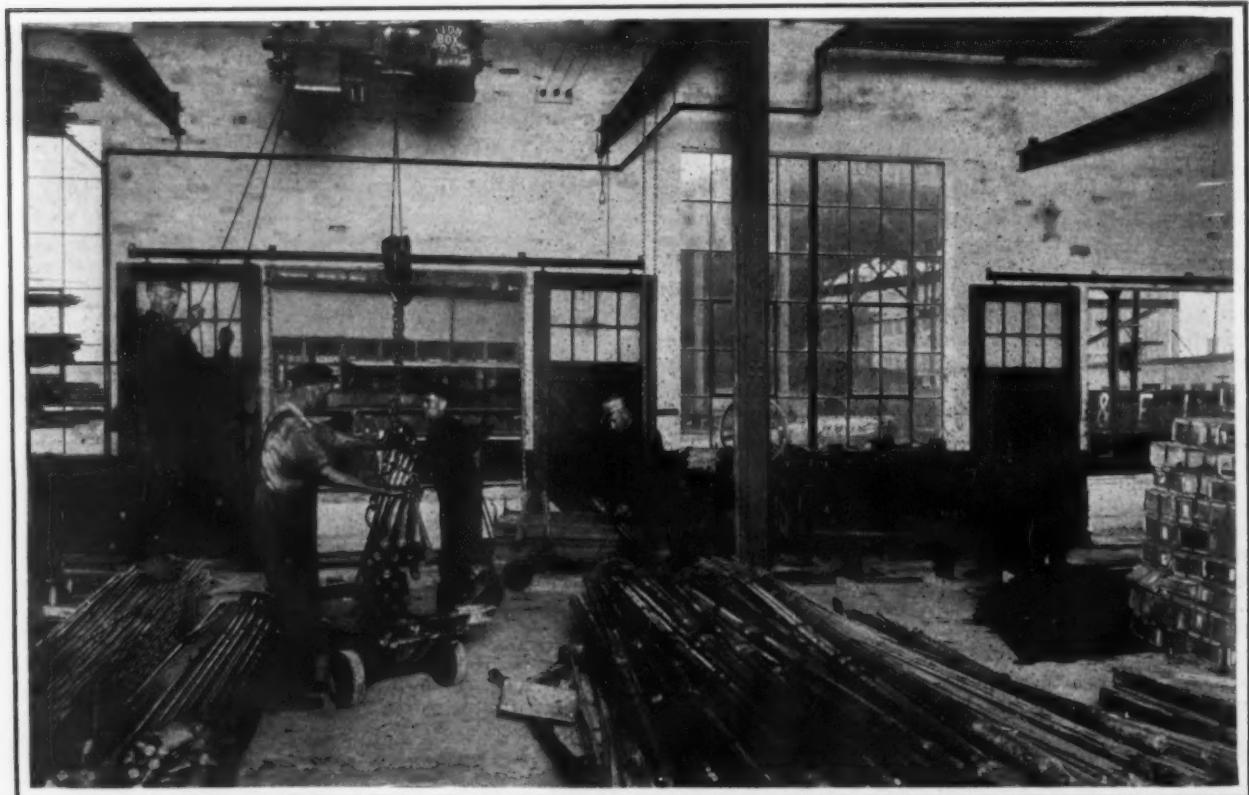
In the west side of the plant is an 8-ft. George A. Ohl Co. shear capable of cutting sheets up to ¼-in. thick, driven by a 25-hp. Westinghouse Electric Co. induction motor. The shear is served by a large rack in which sheared metal is stocked according to size. In close proximity is a Waterbury Farrel Foundry & Machine Co. No. 1½ coil stripper, driven by a 3-hp. Westinghouse motor. This machine also is used to strip cold rolled steel in coils as required. In the east section of the warehouse, between the two doors, are a No. 5 Marvel high-speed power hack saw and a Houghton & Richards band saw, both motor driven.

In the wire storage department, metal racks line one side of the room, in which are stocked steels and wires used by the knitting machinery, needle, fish rod and other manufacturers. The company's drill rod rack also is located in this department. Steam radiation, suspended from the ceiling, reduces moisture to a minimum.

The laboratory is equipped with a Hoskins electric furnace and pyrometer, scleroscopes, etc. While the furnace is run up to 1800 deg. Fahr., average work is done at approximately 1500 deg. to 1600 deg.

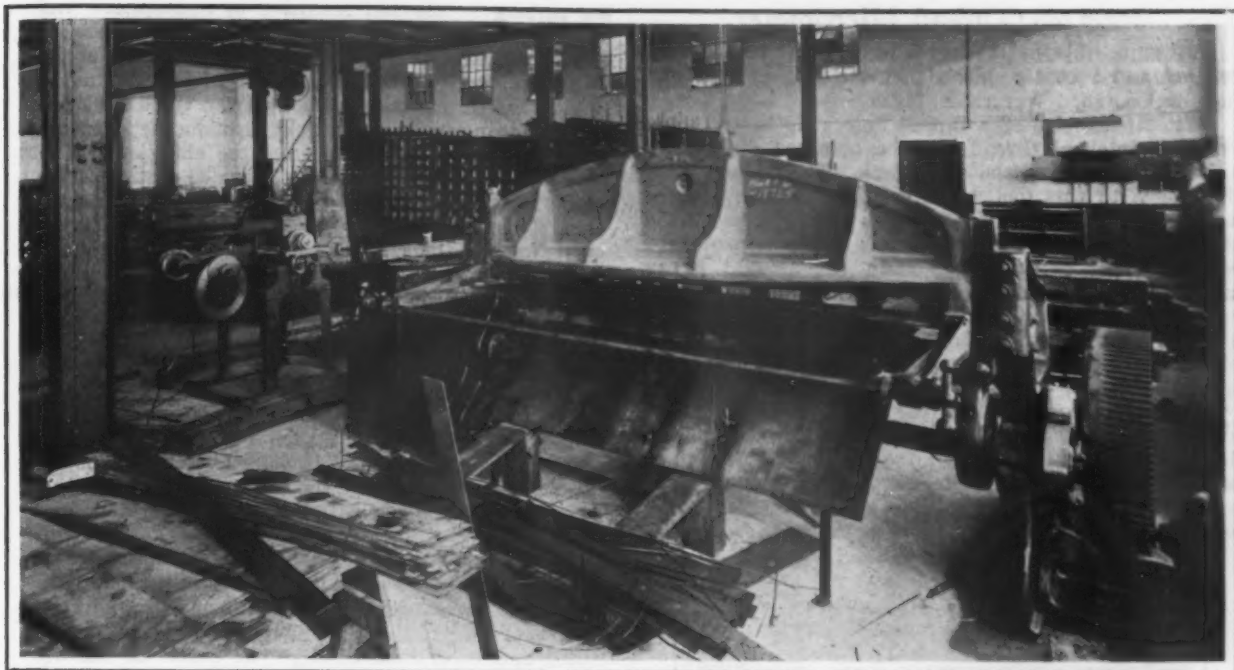
On the east side of the warehouse are two 8-ft. doors through which trucks and wagons pass for loading and unloading. Two one-ton Box electric hoists with 100-ft. runways facilitate the handling of materials. A spur track from the main cross-over line between the Boston & Albany and the Boston & Maine Railroads passes through the Wetherell land, and cars standing on it are unloaded by gravitated runway into the plant.

Abundant natural and artificial light are provided throughout the plant. The warehouse proper, or main storage space, is lighted by eight windows about 10 ft. wide and six more than 12 ft. wide and almost two stories high, while twelve 100 c.p. drop lights furnish artificial light when necessity requires. Eighteen windows on the ground floor and twenty on the second floor furnish ample natural light for the administration section of the plant, and 200 c.p. lamps, artificial light. All partitions in the plant are of wire lath, cement plaster and North Carolina sheathing. Ac-



Handling Rounds by Means of 1-Ton Box Hoist in Main Bay of Storage Space





Storage Room, Showing Shear in Foreground, Coil Stripper at Left and Windows to Office in Upper Background. Beyond stripper will be seen the stairs from executive offices

cess from the executive offices to the main storage department is direct by stairway.

An American Radiator Co. hot-water heater is installed in the boiler room for office heating, as well as a Magee stove for hot water for washing purposes, and a Massachusetts range boiler, 18 x 60 in., tested up to 200 lb. The warehouse proper, which has a cement floor, is heated by an American Radiator Co. Ideal steam heater, located in a boiler room of approximately 32 x 32 ft., constructed below ground, at the northwest outside corner of the plant. The roof of this boiler room being on the street level, ashes are taken from the floor in containers raised to the surface by a hand lift. Two systems of radiation, suspended about 3 ft. from the roof, furnish warmth and dryness in the warehouse during the winter and wet weather.

A. B. Wetherell founded the business some fifty years ago, first in Liberty Square, Boston, where it

was burned out in the famous Boston fire. It then was moved to 31 Oliver St., where it remained until last year, when the business was moved into the present modern warehouse at 251 Albany St., Cambridge.

Originally the firm specialized in Sheffield steels, but gradually has increased its lines. A. B. Wetherell and his brother were instrumental in interesting American mills in the possibilities of high-grade steels. To-day the firm acts as general agent for the Eastern Rolling Mill Co., Baltimore, pickled and annealed one-pass cold rolled automobile and furniture sheets; the Morris & Bailey Steel Co., Pittsburgh, cold rolled strip steel; the Fitzsimons Co., Youngstown, cold drawn screw stock and shafting; and La Belle Iron Works, Steubenville, Ohio, cutlery steels and open-hearth specialties. It has maintained its Sheffield connections these many years, being agent for Kayser, Allison & Co., Ltd., crucible melted steels.

### Machinery Exhibition Building

To promote the sale of all American manufactured mechanical products the Manufacturers' Exhibition Co. has located in the building occupying the block bounded by Sixth Avenue, Eighteenth Street and Nineteenth Street, New York, where will be exhibited machinery of all kinds, including machine tools, tractors, farm implements, printing and textile machinery, etc. Both American and foreign buyers may be able to meet sellers and inspect their products in the one building. L. R. Duffield, president and general manager of the Manufacturers' Exhibition Co., was general manager of the Philadelphia Bourse for some 10 years and was recently general manager of the International Exposition of Industries. New York is considered the logical location for such a permanent exhibit because it is a prominent machinery market for both domestic and foreign buyers.

### Campaign to Increase Use of Sheet Metal

The Sheet Metal Products Association, Chicago, is endeavoring to organize a national advertising campaign among all of the mills in the United States which roll black or galvanized sheets, with the object of creating a greater demand for sheet metal products. An association label is proposed and only manufacturers' products which comply with the terms of this label

would be permitted to use it on their goods. M. B. Armstrong, Lorain, Ohio, is president of the organization; D. C. Jones, St. Paul, Minn., secretary, and C. L. Brown is chairman of the advertising committee. The temporary address is post office box 769, Chicago.

### Fire Damages Heltzel Steel Form & Iron Co.

The plant of the Heltzel Steel Form & Iron Co., Warren, Ohio, was partly destroyed by fire, Thursday, June 2. The company fabricates general steel plate construction and manufactures steel forms for concrete road, sidewalk, curb and gutter and other concrete construction. The steel fabricating department suffered mostly from the damage, shipments of steel forms having been made a short time after the fire. The steel form department has continued operation almost uninterruptedly since the fire. The steel plate fabricating department will be operating again soon.

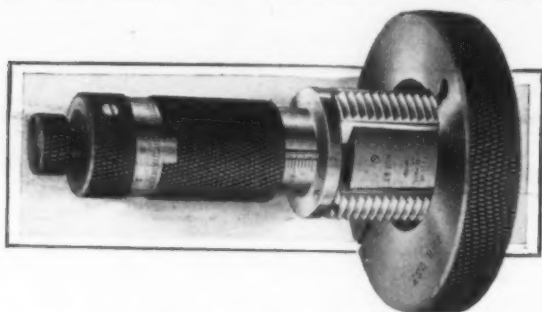
In observance of the twenty-third anniversary of the establishment of the Kearney & Trecker Corporation, Milwaukee, manufacturer of milling machines, the officers of the company gave a dinner recently to the members of the Kearney & Trecker Employees' Association. The employees presented E. J. Kearney and Theodore Trecker, founders and still the principal owners of the company, hand-made carving sets.

### Internal Thread Micrometer

A unique internal thread micrometer has been developed and recently placed on the market by John Bath & Co., Inc., Worcester, Mass.

With it the size of a tapped hole, ring thread gage or other internal thread may be obtained directly in units of ten-thousandths of an inch. The makers state that: "With this tool, there can be found the causes and real reasons for the comings and goings of the screw machine and the automatic. The action of taps with different cutting compounds, the amount a tap cuts oversize, the effect of every thousand pieces as regards tap wear and other conditions may be known and corrected." It is further claimed that the tool eliminates the need of numerous trial plugs, checks and thread gages.

As to its construction, the four measuring jaws are supported and held in alinement by close fitting dovetail slots in the body of the micrometer, which is movable by a micrometer screw. Three distinct steps are used in the manufacture to secure close threaded measuring contact. The micrometer is first ground



The Size of a Tapped Hole May Be Obtained Directly in Ten-Thousandths of an Inch

and lapped when set at the nominal hole size. It is then ground when set at the smallest and also at the largest dimension. This subsequent grinding is said to relieve the threads at each side of the center of the measuring jaws fundamental line contact being thus secured, leaving the threads on the measuring jaws free from interference due to the change in the angle of the helix from the smallest to the largest measurement.

Adjustment is provided so that when wear occurs on the measuring jaws the micrometer may be referred to the master reference ring and the wear taken up on the graduated collar which is provided with serrations for each ten-thousandth of adjustment. The gages can be furnished with any number of threads per inch, in sizes from 1 to 15 in. in diameter.

### Electron Alloys and What They Are

The term "electron" is a general term for a series of magnesium alloys containing over 80 per cent by weight of magnesium, with slight additions of other metals such as zinc. These are manufactured by the Chemische Fabrik Griesheim-Elektron in Germany, according to an article in *Zeitschrift des Vereins deutscher Ingenieure*. An abstract published by *Technical Review*, London, follows:

Electron is a silver-white metal similar in appearance to aluminum, which is suitable for casting or pressing. Considerable difficulties having now been overcome in the casting of this alloy and all types of castings, formerly produced in aluminum (sand cast), can now be made of electron. The slabs which when delivered generally weigh 2 kg. are smelted in wrought iron or cast steel crucibles of 6 to 12 liters capacity. The metal should be poured before it is actually quite fluid. Slight overheating is only necessary in the case of thin-walled or very large castings. The melting point, which is 630 deg. C., should not be exceeded by more than 50 deg. C., as otherwise the thin oxide film floating on the surface commences to burn. To extinguish a fire caused through too high a temperature, about 20 to 30 kg. of a calcium alloy should be added. The calcium has a protective effect and prevents oxidation for some time, although it has the effect of making

the casting brittle and sensitive to atmospheric influences. Owing to the low temperature at which the alloy may be overheated, it is advisable to pour large or thin-walled castings into molds, which are as hot as possible or which are taken directly from the drying oven.

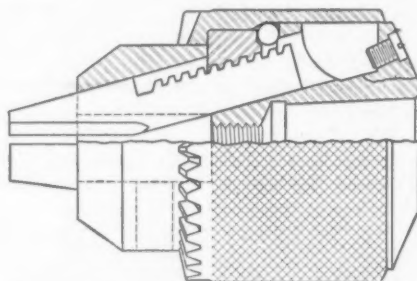
The mean tensile strength of electron metal castings is 12 to 15 kg. per sq. mm. and the elongation 3 to 4 per cent. Thick-walled, carefully-cooled castings have a tensile strength of 2 to 3 kg. per sq. mm. less, and about 3 per cent elongation. The reduction in area is approximately the same as the elongation, and the yield point at 8 to 10 kg. per sq. mm. The Shore scleroscope value is from 10 to 15.

### Improved Drill Chuck

A new drill chuck known as the Super chuck, in outward appearance similar to its previous design but of improved proportions, has been placed on the market by the Jacobs Mfg. Co., Hartford, Conn. The new chuck is designed to meet the changed drilling methods of the last few years with relation to weight and capacity.

The body is of special analysis deeply case hardened steel. In the heat treating process the taper hole is left soft fitting it for use on a hardened and ground arbor. This taper hole is ground to give utmost accuracy. A drilled and taper hole through the center of the body is fitted with a threaded plug, easily removable with a screw driver if it is desired to insert rods or other materials through the chuck and spindle.

Ball bearings inserted between the nut and the body reduce friction to a minimum making it possible to redesign the thread on the nut and the jaws with a coarser pitch than was previously used. The reduction of friction makes it possible to tighten the chuck with greater ease than formerly, thereby preventing undue wear on the keys, sleeves and other parts of the chuck, and at the same time giving greater gripping



Drill Chuck with Ball Bearings Between the Nut and Body. The thread on the nut and jaws is of coarser pitch than usual

qualities. An oil hole provided in the back end of the chuck, makes possible the lubrication of all working parts.

It is claimed that actual tests have shown that only half the pressure on the key in tightening the new Super chuck will give the same results as in chucks of the previous design. The change in pitch of the thread on the jaws has reduced by one-half the number of turns of the sleeve necessary to lighten or loosen the chuck.

Actuated by a desire to assist the flood-stricken district of Colorado, the Pawling & Harnischfeger Co., Milwaukee, has shipped by special through train a No. 206 Corduroy traction type excavator-crane, to the mayor of Pueblo. This, the company believes, will be of service in clearing up the debris, handling materials and for many other purposes.

The members of the Pittsburgh Purchasing Agents' Association are enthusiastic in regard to their trip to Youngstown, Ohio, June 21. Arrangements have been made for a special train for the journey. A thorough sightseeing trip will be made through several plants. In the evening at the dinner, James A. Campbell, president Youngstown Sheet & Tube Co., will speak.



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ESTABLISHED 1855

# THE IRON AGE

EDITORS:

A. I. FINDLEY

WILLIAM W. MACON

GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

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## "Pittsburgh Plus"—or What?

The Federal Trade Commission case against the "Pittsburgh plus" system of selling steel products is getting into swing. The United States Steel Corporation, against which alone the commission's complaint was directed, has made its formal response and hearings in the case will begin soon. While independent steel companies have been expected to attempt to intervene, they have shown no haste to do so. There is plenty of time, however, as the case will necessarily be long drawn out.

From the practical viewpoint a conspicuous feature of the complaint is that it suggests no remedy or alternative. That is strictly legal, as the complaint is simply that section 5 of the Trade Commission act and section 2 of the Clayton act are being violated. Sooner or later, however, the question will be brought in, if this system is a violation of the law, what system would not be? That an alternative should be suggested will undoubtedly be claimed as part of the respondents' defense. If a suitable alternative cannot be suggested, there is something wrong with the laws under which the complaint is issued. This point has already been struck at by the Steel Corporation, its response concluding with a suggestion that a "cease and desist" order by the Trade Commission "would constitute an interference with respondents' liberty of contract and would amount to the taking of respondents' property without due process of law, contrary to the Fifth Amendment to the Constitution of the United States."

In the case of the great bulk of the steel that is sold by the Steel Corporation and the independents, the customer of the mill is not the eventual user or the ultimate consumer. The buyers are intermediaries, being distributors, contractors or manufacturers. This great system, of manufacturing and distributing, is highly complicated. It cannot be struck out and nothing substituted without industry itself being thrown into confusion, and the case will develop argument whether a system can be substituted that will work smoothly and efficiently.

Inclusion in the complaint of the Birmingham arbitrary of \$5 a ton seems to preclude a system of arbitraries from being proposed, or sanctioned,

as an alternative. There was a period when Chicago was a basing point on nails, with an arbitrary above Pittsburgh; and on rails, before the present system of having a uniform price f.o.b. mill (except Colorado) was established, Chicago had a price which was a fixed amount above the price f.o.b. eastern mill. The Trade Commission complaint (paragraph 6) attacks the Birmingham base of \$5 a ton over the Pittsburgh basis not because it is \$5 rather than some other sum, but because it is "arbitrarily arrived at." Apparently, then, no system of basings, with relations to a Pittsburgh or any other fundamental price, would be countenanced, for if the thing were a "system" it could be regarded as "arbitrary."

If a fixed differential between Birmingham, or any other point, and Pittsburgh is objected to, then the doctrine the Steel Corporation has maintained during its whole life, that stable prices are a benefit to industry, is attacked, and that makes a very big issue. Furthermore, if a "cease and desist" order were issued, there would be the recurrent question afterward whether the Steel Corporation had gone far enough away. A very complicated case will be unfolded in the action now begun.

## Labor Getting Light

A St. Louis correspondent of THE IRON AGE suggests that it would be a fitting move if every employer of labor on a large scale would get his employees together and call attention to the recent graft exposure in Chicago among the various union executives, men who are entrusted with the responsibility of the best interests of union labor and, in many instances, with union funds in large amounts. The objection to this proceeding would be that the motives of the employer might be misunderstood. Moreover, there is reason to believe that many workingmen are opening their eyes to the incompetency and dishonesty of some of their leaders, not only in Chicago but in other cities.

Some very plain talking has been done by some of the more intelligent and progressive leaders at Denver within a few days at meetings preparatory to the convention of the American Federation of Labor. For example, the president of the building



trades department openly declared that unions which persist in unnecessary strikes must be treated as the common enemy of unions which live in harmony with employers, adding by way of emphasis that the time has also arrived when the presence of non-union men on a job must not be regarded as cause of or excuse for a strike.

The building trades especially have been cursed by the grafters referred to by our correspondent and intelligent workingmen are beginning to see that graft has been an important factor in checking building operations. Whether this fact will result in any real reform of the unions is, of course, a matter for future development.

### Attitude of the Railroads

Some of the propaganda which is being sent out by the railroads seems to overlook entirely the psychological factor in business conditions referred to in THE IRON AGE last week. As was then pointed out, the remedy for business depression is not a horizontal reduction in freight rates; but it is true that some rates are much too high and the psychology of the situation demands substantial reductions.

Opponents of rate reduction point out that the labor bill of the carriers increased from \$1,468,576,394 in 1916 to \$3,742,486,936 under the Labor Board award of 1920, and it is also a fair argument to state that some commodities would not move even if all freight charges were abolished, because producers can find no market. It is also pointed out that the freight rate on shoes from New York to Pittsburgh is less than 1 cent per pound and that the price of shoes probably would not be reduced if freight charges were entirely removed. That, however, is on the road to saying that freight rates have little or no relation to the cost of living. The presentation of such arguments is by no means convincing to the public that there should be no revision of freight rates. Certainly it would not convince the manufacturers of iron and steel products, upon many of which the rates are excessive.

The public is likely to have little patience with any attitude of the railroads which does not recognize the many cases of injustice in rates that now prevail and the railroads will not gain in popular favor by ignoring prevailing sentiment.

A crumb of comfort is handed the shippers of the country at the close of the long statement made by the railroad executives in refusing to accede to the demand for a reduction of 25 per cent in freight rates on building materials. After arguing at length to show that the railroads could not possibly grant such a reduction until there is a decided reduction in operating costs and an increase of business to restore the proper relation of net to gross earnings, the executives remarked that it must not be overlooked the carriers have realized that the percentage increases in rates produced inequalities and in many instances threw rates out of line. It is asserted that to correct these conditions, the railroads have been and are "diligently adjusting such situations." The results of this policy will be looked for with the greatest interest as indicating to what degree the

railroad executives appreciate the real temper of shippers respecting the operation of many existing rates.

### Iron and Steel in Use

It is a strike of the ultimate buyer of wares made from iron and steel rather than a strike of distributors or of manufacturers who convert the material into forms suitable for use that has brought the demand to the present insignificant proportions. The manufacturing consumer, making agricultural implements or hand tools or hardware or something else from pig iron or rolled steel, is quite willing to buy from the blast furnaces and steel mills if he can sell his products to the ultimate consumer; but he cannot. The contractors are quite willing to buy if they can secure contracts to erect bridges and buildings.

Yet the work of the country is going on to a very considerable extent. Freight ton-mileage last February was at a rate approximately equal to the average in the best pre-war year, and the freight movement now is probably equal to the average for a few years before the war. Bank clearings show a shrinkage from those of a year ago, but not a 50 per cent shrinkage, and they are not small by comparison with pre-war averages even after some allowance is made for certain commodities, and wage rates generally, being higher.

The people are getting along, in a way, with the iron and steel they have in use, without adding much from day to day. The condition prompts inquiry into the matter of how much they have in employment now, and why they have at times made such large additions. Pig iron is a convenient measuring stick, despite the fact that there is a shrinkage in employment of the finished article. The production of pig iron in the United States has been approximately as follows:

	Gross Tons
Through 1900.....	209,000,000
1901-1910 .....	211,000,000
1911-1920 .....	323,000,000
Total .....	743,000,000

For a precise comparison allowances should be made for imports in the early years and exports in recent years as well as for iron absorbed by the late war, but it is unnecessary in a general study to make such fine points. At the end of 1910 nearly all the products made from the pig iron of the preceding ten years were in employment and rendering good service, while something like half the products of the iron made in 1900 and previous years had disappeared entirely. To use precise figures, when only a rough approximation can be expected, that would be 315,000,000 tons of pig iron. If one apply the same rule to the present time, assuming all the iron made in the past ten years to be in service, and half of the iron made more than ten years ago, he finds 533,000,000 tons, or an increase of 70 per cent. The increase in population in the ten years has been about 15 per cent.

A more exact and accurate study might show the increase to have been 60 per cent or 80 per cent instead of 70 per cent, but even if the increase were only 50 per cent there would be basis for certain conclusions. The railroads, years ago the

great buyers of iron and steel, have not increased the quantity in service by any large percentage in the past ten years. They had about 50,000,000 tons of rails in service ten years ago, and they have not much more now, while increases in other descriptions of railroad material have been similarly light. The increase in iron and steel in other forms of employment must have been correspondingly greater. A very large amount of steel went into hotel, office and factory buildings. There is much iron and steel in employment on the farms.

It is plain that what is commonly called the "consumption" of steel is really the addition of steel to an already very large store that is in service. These additions can vary widely in amount. They can be amazingly heavy or surprisingly light. Meanwhile the enormous store of things made of iron and steel is able to render regular service.

### The Electric Furnace in Alaska

An example of the flexibility of the electric furnace is afforded by the account elsewhere in this issue of the results obtained from a steel furnace of the Heroult type in far-off Alaska. At the plant of a mining company at Treadwell both iron and steel castings are constantly needed in regular mining operations; but coke is scarce at \$50 a ton and, even if available in quantity, too expensive for the manufacture of gray iron castings in the cupola. Scrap is always ready at hand. In one electric furnace of two tons' capacity iron castings are made three or four times each week and steel in the meantime. In the morning gray iron castings of superior quality are made, followed by steel castings in the afternoon.

Besides this marked flexibility of operation, equaled probably nowhere in this country, there are the added advantages in the case of iron of the absence of dull metal, the pouring of the metal in portions at any time and the sure regulation of the temperature. Plain castings of steel or iron are at the melter's command, as well as castings containing any desired alloy. It even has been demonstrated that a steel heat, frozen in the furnace, was recoverable as molten steel with no great difficulty, a feat impossible in any other steel-making medium.

These striking facts suggest the wide use of the electric furnace in countries where coal and coke are unavailable but where castings of both kinds are a constant necessity and where delays in waiting for their delivery mean more cost than the increased expense of their production in such a furnace. In our own and other countries, cheap electricity will perhaps mean a considerable displacement of the cupola and the springing up of foundries making iron or steel castings of all kinds electrically.

A feature of our recent steel export trade is the movement of steel rails, which has been very heavy. The 1921 rate to May 1 has been exceeded only once and nearly 20 per cent of the April and May exports of iron and steel was rails, a percentage probably never equaled before. The actual figures are 49,662 gross tons of rails exported

per month to May 1, this year, as compared with 54,370 tons per month in 1919 and only 38,379 tons per month in 1913. Of the March exports of 230,635 tons, rails were 48,127 tons or nearly 21 per cent. The April statistics show 31,392 tons of rails out of a total of 162,592 tons, or 19.2 per cent. Of particular interest is the destination. Cuba is the largest buyer, with the Dutch East Indies next and Brazil third for the 10 months ended with April; but purchases by Japan and China combined have been very heavy lately. Before the war Canada was our largest customer but that country to-day ranks low in the list of users of American rails. Unless the British steel industry can soon find itself, America will continue to be the world's chief source of rails.

### Industrial Conditions in England and Germany

C. C. Joys, New York district sales manager Steel & Tube Co. of America, has returned from a sojourn of three months in England and the Continent.

"To visit England during the last three months is," says Mr. Joys, "seeing the Kingdom at a great disadvantage. Due to the coal strike, every basic industry is practically at a standstill. Eleven weeks of this calamity has brought about a depression from which it will take months to recover after production is again resumed, and aside from the blow to industry, will undoubtedly cause considerable suffering during the winter months to come.

"By subsidizing the miners, as the Government has offered, it is difficult to believe this same method of a 'forced peace' will not spread to other classes of labor, the results of which may be very serious. In addition, the continuance of 'the wage for the unemployed' cannot but lead to higher taxation.

"Germany is working night and day, and seems to be on the road to a great recovery in all lines of endeavor."

### Will Have Ore Rate Hearing in Chicago

WASHINGTON, June 14.—The Adriatic Mining Co. case, involving rates on iron ore from mines in Minnesota, Michigan and Wisconsin to upper lake docks, has been assigned by the Interstate Commerce Commission for hearing July 25 at the Great Northern Hotel, Chicago, before Examiner Hosmer. The case consolidates complaints of the shippers, including the Lake Superior Iron Ore Association, against increased rates that went into effect last February from mines in Michigan and Wisconsin, and those that previously were in effect from all mines in Minnesota, Michigan and Wisconsin. Railroads are said to have offered to withdraw the increases which went into effect in February provided the complaint against those prevailing previously was withdrawn, but shippers declined to do this. It is said that the latest increases may be withdrawn voluntarily and without any attending obligation on the part of shippers before the hearing begins, in which instance it would relate to the older rates exclusively.

### Merger of Massillon, Ohio, Companies Probable

PITTSBURG, June 14.—It is announced that the prospective merger of all the interests of the Central Steel Co., the Massillon Rolling Co. and the National Pressed Steel Co., all of Massillon, Ohio, and involving about \$18,000,000 of assets, has practically been consummated. The directors have agreed to the merger and a meeting of stockholders of the three companies will be held at an early date, at which time the merger is expected to be ratified.

The usual summer outing of the Pittsburgh Foundrymen's Association will be held this year on Monday, June 20, at "The Willows," Oakmont, Pa., a few miles out of Pittsburgh.



## AMERICAN FOREIGN TRADE

### Inquiries Continue from Far Eastern and South American Sources

NEW YORK, June 14.—Fair-sized export inquiries continue to appear in the market from Far Eastern and South American sources. Fluctuation of exchange rates, particularly with European countries, serves as an additional factor of uncertainty in the export situation. A New York exporter, who represents Belgian mills, states that a week ago he could not have imported any materials in competition with the domestic market, but with the recent drop in exchange rates he is in a position to deliver Belgian sheet bars and billets, c.i.f. Atlantic Coast ports at \$33 to \$35 per ton, depending upon the size and specifications of the order.

#### Some South American Activity

The South American market shows some signs of a slight revival in buying, although the large stocks of material at ports remain largely unliquidated. A general meeting of the "Commission to Consider Relief of Merchandise Congestion in Latin America," which was formed in May by the American Manufacturers' Export Association, Argentine Chamber of Commerce, Brazilian Chamber of Commerce and the Pan-American Advertising Association, will probably be held next week at the Hotel Commodore, to hear the report of the committee appointed to consider relief measures.

An inquiry for charcoal iron boiler tubes that, if placed in the United States, will amount to about \$100,000 has been received by a New York exporter. Another inquiry is being handled by a New York company for forty 1-ton industrial trucks equipped with cranes for docks at a South American port. Arrangements are being made for the electrification of two Brazilian railroads. It is understood that the inquiries will be issued in the American market in about two weeks.

#### Far East Continues to Buy

Far Eastern markets continue active. While the cabled order received by the Universal Steel Export Co., 26 Cortlandt Street, New York, from China may include most of the original specifications on which bids were submitted, the final order has not yet been received. The inquiry called for 78 large-type locomotives, 450 steel cars of 40 tons' capacity, 300 box cars of 40 tons' capacity and 250 open-side cars of 40 tons' capacity. The total order would amount to about \$4,000,000 if placed in its entirety. This company is offering about 4000 boxes of tin plate to domestic or foreign trade.

Japanese buyers and sellers are still facing a declining market, any prospects of a stiffening tendency having been eliminated by the present declining condition of the American market. Pig iron has reached a new low level of 50 yen per ton, which has enabled Japanese holders to offer for export at \$33 per ton, c.i.f. Pacific Coast port, but no buyers are reported. Sales of structural material, bars, etc., according to one Japanese house in touch with Japanese buying conditions, must be based on better than 2c. per lb. Pittsburgh to obtain business. In connection with this price, the nine bridges for replacement purposes in the vicinity of Tokio, which have been in the hands of various Japanese houses, were awarded to Mitsui & Co., New York. This company purchased the material f.o.b. cars New Orleans and as it controls its own line of ships, the material is reported to have been sold at a price of not over \$60 per ton, c.i.f. Japanese port.

Current prices in the Japanese market, according to a recent cable of quotations, are: Steel bars, 84 yen (\$40.42) per ton; shapes, 122 yen (\$58.70) per ton; steel plates, 78 yen (\$37.53) per ton; blue annealed sheets, 94 yen (\$45.23) per ton; black sheets, 187 yen (\$87.58) per ton; galvanized sheets, 313 yen (\$150.62) per ton; galvanized wire, 143 yen (\$68.81) per ton; tin plate, 10 yen (\$4.81) per base box; wire nails, 11.50 yen (\$5.53) per keg, and pig iron, 50 yen (\$24.06) per ton. Copper is held rather steadily at 570 yen (\$274.28) per ton.

Among several construction contracts on office and

similar types of modern fireproof buildings that have been pending, one has been placed with George A. Fuller of the Orient, New York, for a fireproof office building in Osaka, Japan, which will be occupied by the Far Eastern office of Brunner, Mond & Co., chemists, London, England. The total cost will be about \$300,000 and the structural steel will probably amount to about 350 tons.

#### Lyons Fair to Be Held in October

The next meeting of the Lyons Industrial Fair will be held at Lyons, France, Oct. 1 to 15. The principal groups of industries represented will be industrial supplies, light hardware, metallurgy, general engineering, industrial buildings, electrical engineering, etc. Arrangements for exhibits may be made at 150 Nassau Street, New York.

### American Specifications in French

A number of the standard steel specifications of the American Society for Testing Materials has been put into French by the bureau of foreign and domestic commerce of the Department of Commerce, and they are available at 5c. a copy from the superintendent of documents, Government Printing Office Washington. These pamphlets of industrial standards are as follows:

103, Open-hearth steel girder and high tee rails. 104, Low carbon steel splice bars. 112, Carbon steel bars for railroad springs. 113, Carbon steel and alloy steel blooms, billets and slabs for forgings. 114, Carbon steel and alloy steel forgings. 115, Quenched and tempered steel axles, shafts and other forgings for locomotives and cars. 118, Carbon steel car and tender axles. 119, Wrought solid carbon steel wheels for steam railroad service. 131, Wrought iron plates. 134, Cast iron locomotive cylinders. 136, Medium hard drawn copper wire. 144, Structural nickel steel.

116, Quenched and tempered alloy steel axles, shafts, and other forgings for locomotives and cars. 120, Steel tires. 124, Welded steel pipe. 126, Boiler rivet steel. 129, Engine bolt iron. 130, Refined wrought iron bars. 132, Welded wrought iron pipe. 135, Hard drawn copper wire. 137, Soft or annealed copper wire. 138, Lake copper wire bars, cakes, slabs, billets, ingots and ingot bars. 140, Spelter. 141, Quenched high carbon steel splice bars. 142, Quenched carbon steel track bolts. 145, Structural steel for ships. 146, Rivet steel for ships. 153, Cold drawn open-hearth automatic screw stock. 154, Iron and steel chain. 155, Foundry pig iron. 158, Manganese bronze ingots for sand castings.

### The Iron Age and Its Readers

A review of the 306 reading pages of the last four issues of THE IRON AGE shows that 25 contributions were made on iron, steel and metal technology, 20 on iron and steel plant equipment, 12 on founding and the foundry trade, 9 others on other industrial plant equipment subjects, besides a special article on forging and one on stamping. Some 26 articles described new machine tools and shop appliances, 8 related to fuel questions and 23 covered engineering society activities. Four conferences of jobbing interests were reported at length.

On employment and labor matters and the human factor generally, there were 48 articles, not including a few relating to the educational problem. The broad economics of the field of THE IRON AGE called for 17 articles, and in addition were 24 on taxation, tariff, freight rate and other vital business questions being considered at Washington.

Reports on foreign conditions have covered, besides Great Britain, also France and Belgium, Germany, Czecho-Slovakia, Austria, Sweden, Italy, Luxemburg, Russia, Japan, South America and South Africa.

# Iron and Steel Markets

## AWAITING DEVELOPMENTS

### Some Betterment Looked for in Fall

#### Production Remaining Under Consumption— Slower Operations in the Week

So pronounced is the stagnation that the trade has given up hope that anything can be done to break the accentuated summer dullness. The continued excess of consumption over production is digging into stocks in consuming hands and some expansion in demand is counted on in the early fall. The quick deliveries asked on much of the run of new orders indicate that stock balances are far from remaining well rounded out.

Except for a further slowing down of operations, the week has been devoid of developments. Gaging of the percentage of producing capacity that is active is difficult. It is doubtful if for the industry as a whole output is above a 25 per cent rate. The estimate for the Pittsburgh region is that it is around 20 per cent.

Seven of the open-hearth plants of the Carnegie Steel Co., including blast furnaces, are idle. Two more of its blast furnaces are expected to go out of blast this week, leaving only 15 of its total of 59 in operation. One Steel Corporation stack has been blown out in Chicago, leaving nine active out of 29. The corporation's steel output in the Chicago district is put at 30 per cent of normal.

Price changes have been unimportant. The recessions, as in wire products, sheets, chain and cast-iron pipe, brought no better demand. Bidding for export business, small but conspicuous by comparison with the orders making up domestic sales, brings out price weakness which points the way attractive inquiries will be received except in the event of an expansion beyond present hopes for 1921.

Railroad equipment repair work is expected to increase in volume in preparation for grain movements, seeing how large is the number of bad order cars. Of the several thousand tons of fabricated work put under contract, some 1500 tons was for tank work, with fresh tank projects requiring 4000 tons. Some fabricators appear to be counting on 2c. plates and 2.10c. shapes in their estimating.

Following the long continued decline in pig iron prices, concessions are still being made. Prices on foundry irons are at least 50c. lower in Cleveland and Chicago, and resale basic is a disturbing factor in the Pittsburgh district. Buffalo furnaces are competing actively and Chicago iron is being sold at low prices as far distant as Ohio. The reported sale of 25,000 tons of Southern foundry iron to a cast-iron pipe company at a very low price is now denied.

Coke making is reported as about 10 per cent of normal in the Connellsville coke regions.

Tin plate from stock has been sold at prices ranging from \$5 to \$5.75 per base box against the mill quotation of \$6.25.

Structural and boiler rivets are obtainable at 3c. and 3.10c. respectively in carload lots.

The 50 per cent ferrosilicon market has broken sharply and is now available at \$69 to \$70, delivered, for early delivery.

The awful straits of the British industry is emphasized by the May production data. The pig iron output was 13,634 tons and that of steel 5574 tons, against 60,300 tons of pig iron and 68,400 tons of steel in April and a monthly average in 1920 of 667,325 tons and 754,733 tons respectively.

German shipbuilding, bicycle, typewriter and rolling stock works are reported busy, some of the latter (locomotives and cars) having orders for more than a year ahead, many from Balkans. Imports of American machinery is embargoed wherever similar goods can be produced in Germany.

## Pittsburgh

PITTSBURGH, June 14.

Operations of blast furnaces and steel works in the Pittsburgh, Valley and Wheeling districts are at a lower rate this week than last; in fact, down very close to a 20 per cent basis, while the amount of new business in pig iron, semi-finished steel and finished steel products seems also to be steadily shrinking. The Carnegie Steel Co., which has a total of 59 blast furnaces in the Pittsburgh and nearby districts, has been operating only 17 stacks, and this week will blow out two more at Newcastle, Pa. The 15 in operation will be the smallest number the Carnegie company has operated since it became a subsidiary of the Steel Corporation. No less than seven open-hearth steel works belonging to the Carnegie company, together with all the blast furnaces located at these steel plants, are now idle, with little prospect of early resumption. Its Homestead, Edgar Thomson and Ohio works at Youngstown are running, but probably not to more than 50 per cent.

The idea is so strongly implanted in the minds of the trade that lower prices on steel are coming that both jobbers and consumers are not buying a ton of anything they do not urgently need. Price changes in the past week were unimportant, but the tendency is steadily downward. Not enough new business in anything is coming out to tempt makers to cut prices. It was demonstrated early in the year and several times since that cutting in prices fails to stimulate demand. This has been proven very recently in wire products, chain and several other lines of finished steel, on which material reductions in prices have lately been made, and resulted in no increase in demand.

The only really encouraging feature of the situation is that consumption is no doubt equal to, or ahead of, production, and stocks are low among mills and jobbers. This is shown by the fact that almost invariably when orders are placed they are accompanied by a request for quick shipment.

**Pig Iron.**—The local market is almost stagnant and is likely to drag along as it is now for some months, but probably lower prices will develop. Not a merchant blast furnace in the two Valleys or in the Pittsburgh district is in operation, and all are likely to be idle



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 14, 1921	June 7, 1921	May 17, 1921	June 15, 1920
No. 2X, Philadelphia†....	\$25.50	\$25.50	\$25.84	\$47.15
No. 2, Valley furnace†....	22.50	22.50	23.50	45.00
No. 2, Southern, Cin'tit....	26.50	26.50	26.50	45.60
No. 2, Birmingham, Ala.†....	22.00	22.00	22.00	42.00
No. 2 foundry, Chicago*....	21.00	21.50	23.00	43.00
Basic, de'l. eastern Fa....	25.00	25.00	25.00	44.80
Basic, Valley furnace....	21.00	21.00	22.00	44.00
Bessemer, Pittsburgh....	24.96	24.96	25.96	44.40
Malleable, Chicago*....	21.00	21.50	23.00	43.50
Malleable, Valley....	23.00	23.00	24.00	44.00
Gray forge, Pittsburgh....	23.46	23.46	23.46	43.40
L. S. charcoal, Chicago....	37.50	37.50	37.50	57.50
Ferromanganese, delivered	75.00	75.00	85.00	225.00

Rails, Billets, etc., Per Gross Ton:	June 14, 1921	June 7, 1921	May 17, 1921	June 15, 1920
Bess. rails, heavy, at mill.	\$45.00	\$45.00	\$45.00	\$55.00
O.-h. rails, heavy, at mill.	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh....	37.00	37.00	37.00	60.00
O.-h. billets, Pittsburgh....	37.00	37.00	37.00	60.00
O.-h. sheet bars, P'gh....	39.00	39.00	39.00	80.00
Forging billets, base, P'gh	42.00	42.00	42.00	85.00
O.-h. billets, Phila....	42.74	42.74	42.74	64.10
Wire rods, Pittsburgh....	48.00	48.00	48.00	75.00

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.25	2.25	2.25	4.25	
Iron bars, Chicago.....	2.25	2.25	2.25	3.75	
Steel bars, Pittsburgh....	2.10	2.10	2.10	3.50	
Steel bars, New York....	2.48	2.48	2.48	4.02	
Tank plates, Pittsburgh....	2.00	2.00	2.20	3.50	
Tank plates, New York....	2.38	2.38	2.38	3.77	
Beams, etc., Pittsburgh....	2.20	2.20	2.20	3.10	
Beams, etc., New York....	2.58	2.58	2.58	3.27	
Skelp, gr. steel, P'gh, lb..	2.20	2.20	2.20	2.75	
Skelp, sh. steel, P'gh, lb..	2.20	2.20	2.20	3.00	
Steel hoops, Pittsburgh....	2.75	2.75	2.75	5.00	

\*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	June 14, 1921	June 7, 1921	May 17, 1921	June 15, 1920
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.85	3.85	4.00	5.50
Sheets, galv., No. 28, P'gh.	5.00	5.00	5.00	7.00
Sheets, blue an'l'd. 9 & 10	2.90	2.90	3.10	4.50
Wire nails, Pittsburgh....	3.00	3.00	3.00	4.00
Plain wire, P'gh.....	2.75	2.75	3.00	3.50
Barbed wire, galv., P'gh.	3.85	3.85	4.10	4.45
Tin plate, 100-lb. box, P'gh.	\$6.25	\$6.25	\$6.25	\$7.00

Old Material, Per Gross Ton:	June 14, 1921	June 7, 1921	May 17, 1921	June 15, 1920
Carwheels, Chicago.....	\$13.25	\$13.50	\$15.00	\$35.50
Carwheels, Philadelphia...	18.00	18.00	16.00	38.00
Heavy steel scrap, P'gh....	13.00	13.00	13.50	25.00
Heavy steel scrap, Phila....	11.50	11.50	12.00	22.50
Heavy steel scrap, Ch'go....	11.00	11.50	11.50	22.50
No. 1 cast, Pittsburgh....	17.00	17.00	18.00	32.00
No. 1 cast, Philadelphia....	17.50	17.50	18.00	37.00
No. 1 cast, Ch'go (net ton)	13.00	13.00	14.00	35.50
No. 1 RR. wrot, Phila....	15.00	15.00	15.00	33.00
No. 1 RR. wrot, Ch'go (net)	9.50	10.00	10.50	25.00

Coke, Connellsville,	Per Net Ton at Oven:	June 14, 1921	June 7, 1921	May 17, 1921	June 15, 1920
Furnace coke, prompt....	\$3.00	\$3.00	\$3.25	\$15.00	
Furnace coke, future....	3.25	3.25	3.40	15.00	
Foundry coke, prompt....	4.50	4.50	4.50	16.00	
Foundry coke, future....	5.00	5.00	5.00	16.00	

Metals,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York....	13.00	13.00	13.00	19.00	
Electrolytic copper, N. Y.	13.00	13.00	12.75	19.00	
Zinc, St. Louis.....	4.45	4.55	4.85	7.55	
Zinc, New York.....	4.95	5.05	5.35	7.90	
Lead, St. Louis.....	4.25	4.50	4.95	8.50	
Lead, New York.....	4.50	4.75	5.12 1/2	8.75	
Tin, New York.....	29.25	29.00	33.25	45.50	
Antimony (Asiatic), N. Y.	5.20	5.20	5.25	7.87 1/2	

for some months. Furnaces are shipping from stocks the small orders for iron they are getting. The only noteworthy sale of pig iron in the week was one of 2000 tons bought by a Shenango Valley open-hearth steel plant from a Youngstown steel interest at the reported price of \$21 at furnace. An Allegheny steel plant has again bought about 500 tons of resale basic which, figuring the Valley rate, would net the furnace less than \$21, but this iron did not come from the Valley. We also note a sale of 500 tons of No. 2 foundry iron for last quarter delivery at about \$23, Valley furnace. The fact that this price for delivery so far ahead and on such a small amount of iron was accepted at to-day's price, is an interesting development as showing the downward trend of prices. Sales of probably 100 tons of standard Bessemer iron are noted at \$23, Valley Furnace. Little is being done in foundry iron, as foundries in this district are running light, and have very little work ahead. The blast furnace of the Stewart Iron Co., at Sharon, Pa., which always runs on low phosphorus Bessemer iron, is idle, but is filling carload orders from stock at about \$38.50 at furnace for iron running not over 0.04 in sulphur and phosphorus. Prices on all grades of pig iron are weak and a lower market is expected.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.96 per gross ton:

Basic .....	\$21.00
Bessemer .....	23.00
Gray forge .....	\$21.50 to 22.00
No. 2 foundry.....	22.50 to 23.00
No. 3 foundry.....	22.00 to 22.50
Malleable .....	23.00

**Ferroalloys.**—The local market is very dull, the only inquiry of note being one for 200 tons of spiegel-eisen for a Youngstown steel interest on which \$31 at

furnace is quoted, but this low price did not take the business. A fairly large consumer of ferromanganese that usually buys in not less than 100-ton lots, put out an inquiry the other day for 5000 lb., and refused to increase the quantity after being named a fairly low price. Domestic ferromanganese is about \$75 delivered, this price having been done on several carload lots. English is held at about the same price, seaboard, but is out of it as far as this market is concerned. It is said that Canadian ferromanganese is being offered in this country at less than the domestic price. Prices are practically nominal, in the absence of actual sales on which to base the market.

We quote 76 to 80 per cent ferromanganese at \$75 to \$80 delivered on domestic; English, 76 to 80 per cent, \$75, c.i.f. Atlantic seaboard. We quote average 20 per cent spiegel-eisen at \$30 to \$32 furnace quoted by makers on direct business and \$28 to \$30 furnace on resale tonnages; 50 per cent ferro-silicon, \$70 to \$75 furnace, freight allowed, for domestic and foreign material. Bessemer ferro-silicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, \$41.50; 10 per cent, \$45; 11 per cent, \$48.50; 12 per cent, \$51.60. Silvery iron, 6 per cent, \$32; 7 per cent, \$33.50; 8 per cent, \$35.50; 9 per cent, \$37.50; 10 per cent, \$40; 11 per cent, \$43.30; 12 per cent, \$46.60. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is \$4.06 per gross ton.

**Billets, Sheet Bars and Slabs.**—Practically nothing is being done on semi-finished steel, on which to base prices. The sheet and tin plate mills are running at not more than 25 per cent and are specifying very slowly against contracts for sheet bars. There is no indication of an increase in demand for billets or sheet bars, and the Carnegie Steel Co. has no less than seven of its steel plants idle. Prices are largely nominal in almost the entire absence of new business.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at \$37; 2 x 2-in. billets, \$39; Bessemer and open-hearth sheet bars, \$39; slabs, \$38; forging billets, ordinary carbons, \$42, all f.o.b. Youngstown or Pittsburgh mills.

**Wire Rods.**—Local makers have no inquiry for wire rods, one concern stating it had not made a sale of rods in some months. No betterment in the demand is looked for until conditions in the wire trade improve. Some makers of rods have orders on their books placed some time ago at higher than present prices, but say they cannot get specifications. Local makers are holding soft rods at \$48 Pittsburgh, but if any desirable business should develop, this price would be shaded. Prices are given on page 1657.

**Plates.**—The demand is very light, even carload orders being scarce. The Pittsburgh-Des Moines Steel Co. is again the low bidder on the tanks for the Shipping Board, but the order has not yet been placed. The car and boiler shops are doing very little except small repair work, and are buying very little tonnage. Output of plates at present is not more than 25 per cent of normal. We quote  $\frac{1}{4}$ -in. and heavier sheared tank plates at 2.20c. base, Pittsburgh. If any desirable business on plates were coming out, some mills would shade this price.

**Structural Material.**—The local market is very dull, and has been embarrassed by the strike of the building trades, which started June 1 and is likely to be long drawn out. The only local job of any importance in the market is for the new shops of the Crane Co. in this city, about 800 tons, which may be closed this week. Fabricating interests here report that never before in their history were so few jobs being placed as now, and of such small size. Prices on plain material are given on page 1657.

**Iron and Steel Bars.**—The demand for soft steel bars is mostly for small lots and prompt shipment. Mills are filling orders largely from stock and when they cannot do this, are turning the business down, it being so small in volume as not to warrant the mills starting up. Reinforcing bars, rolled from billets, are held at about 2.10c. base, but when rolled from old steel rails or other material are quoted as low as 1.80c. A Pittsburgh mill will likely get the order for about 1700 tons of reinforcing bars to be used in the Baldwin reservoir at Cleveland. Little is being done in common iron bars and prices are weak.

We quote steel bars rolled from billets at 2.10c.; reinforcing bars, rolled from billets, 2.10c. base; reinforcing bars rolled from old rails, 1.90c. to 2c.; refined iron bars, 2.75c.; in carloads, f.o.b. mill, Pittsburgh.

**Wire Products.**—Local makers say that the recent cut of \$5 per ton in prices on wire and wire nails has not bettered the demand in the slightest, jobbers and consumers still placing only small orders for quick shipment, and to meet current needs. The American Steel & Wire Co. is naming the same prices as the independent mills. The trade is looking for lower prices on wire and wire nails in the near future, and stocks carried by jobbers and consumers are light. Some buyers are holding back shipping instructions on orders already placed, in anticipation of lower prices.

We quote wire nails at \$3 base per keg, Pittsburgh, and bright basic and Bessemer wire at \$2.75 base per 100 lb. Pittsburgh.

**Steel Rails.**—The Carnegie Steel Co. is said to have a good volume of orders on its books for standard rails, but the railroads are not specifying against these contracts, being short of money and not spending a cent for new equipment that can be avoided. The demand for light rails from the coal interests is fairly active, but from other users is very quiet.

We quote 25 to 45-lb. sections, rolled from new steel, 2.20c.; rolled from old rails, 1.90c. to 2c.; standard rails, \$45 mill for Bessemer, and \$47 for open-hearth sections.

**Nuts, Bolts and Rivets.**—Makers say there is no betterment in the demand, the trade still placing only small orders to cover actual needs. Local makers of nuts and bolts are running at only about 25 per cent of capacity, one large plant operating only three days a week on short time. Prices on rivets are weak, and \$3 per 100-lb. has recently been quoted on both structural and boiler rivets. Prices and discounts are given on page 1657.

**Spikes.**—Local makers say there is very little inquiry from railroads for spikes, and orders being placed are only for a few hundred kegs at a time for repair work. In fact, several makers say they prefer not to

sell heavily to some of the railroads owing to their financial condition. Local spike mills are not running at more than 20 to 25 per cent of capacity. Base sizes are still quoted \$3.40 per 100 lb., but on large sizes this price is shaded 10c. to 15c. per keg. The Rock Island Railroad recently placed 200 kegs with a local maker.

**Hot and Cold-Rolled Strip Steel.**—Some makers of hot rolled strips report orders slightly better, but on the whole, the condition in both hot and cold-rolled strips is very unsatisfactory. Several makers seem very anxious for orders, and are shading prices in an effort to get them. Prices are somewhat uneven and 2.75c. for hot-rolled and 5.50c. for cold-rolled strips, have been slightly shaded on some recent orders. Two large plants in this city making hot and cold-rolled strips are not operating at more than 25 per cent of capacity and say they have very little business.

**Cold-Finished Steel Bars.**—A local maker reports that never in his history has he seen the demand for this material as quiet as it is at present, and there are no signs of any betterment in the near future. Consumers are carrying fairly large stocks and seem anxious to reduce them, in view of possibly lower prices to come before long. We quote cold finished steel bars at 3c. to 3.10c. at mill, but buyers would have no trouble in placing even small orders at the lower price.

**Steel Skelp.**—This material is holding fairly firm at the regular price of 2.20c. Pittsburgh, but there is practically no new business. Mills that buy skelp in the open market have enough on hand to run them for some time at the present low rate of operation.

**Iron and Steel Pipe.**—Local pipe mills and also Valley mills are not operating at more than 25 to 30 per cent. No orders are in the market for either gas or oil lines, but reports are current of a foreign inquiry for a large tonnage of 10-in. pipe, presumably to be used in foreign oil fields. None of the local pipe mills has this inquiry and it is not known whether it is authentic. Prices on butt and lap-weld steel pipe are being pretty well maintained as agreed upon April 14, but on line pipe, if any business was offered, could readily be heavily shaded. It is said on two or three recent small orders, what were regarded as official prices on line pipe were cut from \$3 to \$5 per ton. On standard iron and steel pipe, not enough business is offered by mills to induce them to cut prices, and they say that even if they shaded prices, it is doubtful whether it would bring out any desirable orders. Mills and jobbers are cutting down stocks all they possibly can, anticipating another reduction in prices on pipe in the near future. Discounts are given on page 1657.

**Sheets.**—There is no betterment in the demand or in prices, but it is claimed that reports of serious cutting in sheets from the April 13 prices are exaggerated. It is pointed out that early in the year some sheet mills started to cut prices in an attempt to get business, but that it did not increase orders. Here and there some shading is being done, but it is claimed it does not amount to more than \$2 to \$3 per ton at the outside. Blue annealed sheets have been shaded about \$2 and black possibly \$3, but not enough business is coming out in sheets to tempt the mills to cut prices. The general average of operations among the sheet mills is not over 25 per cent, and a few plants are running at 20 per cent or less. Prices are unchanged and are given on page 1657.

**Tin Plate.**—This material is very quiet and any new business is for only small lots, usually shipped from stock. Large can makers and other important users of tin plate are doing very little and are holding back specifications against contracts. The McKeesport Tin Plate Co. is rapidly recovering from the recent fire and this week is operating 28 out of 44 hot mills. The average rate of operation among tin plate mills is 25 per cent or less. There is some shading in prices of tin plate, but the American Sheet & Tin Plate Co. is not quoting less than \$6.25 per base box, the April 13 price. Small orders from stock are being filled at prices as low as \$5 and up to \$5.50 and \$5.75 per base box.

**Chain.**—So far, the reduction in prices on some grades of chain, effective from June 1, and given in detail in our report of last week, have not increased the demand to any extent. Buyers of chain feel that prices



may go still lower, and are buying carefully, placing orders only for small lots for quick shipment, and to meet current needs. On trace chain, it is understood the two leading makers are guaranteeing prices against decline for the season which ends in April, next year.

**Hoops and Bands.**—The Carnegie Steel Co. reports it is quoting steel hoops and bands at 2.75c. at mill, but other makers are shading this price, selling as low as 2.50c. at mill. Mills are not running to more than 25 per cent and are filling the few small orders being placed largely from stock.

**Cotton Ties.**—The Carnegie Steel Co. states it will not announce its prices on cotton ties for this season for some time, and the independent makers are pursuing the same policy. There is no inquiry for cotton ties. Prices this year will likely be lower than last year. Consumers have heavy stock carried over from the 1920 season that will meet their needs for some time.

**Coal and Coke.**—Present conditions in the coal and coke markets are referred to by several leading producers as being most deplorable, the demand for both coal and coke being very dull and prices showing a strong tendency to go lower. From Pittsburgh and Valley districts there is absolutely no demand for furnace coke, and very little for foundry. The H. C. Frick Coke Co. is running none of its coke ovens, but is operating some of its river coal mines, shipping the coal to the by-product coke plant of Carnegie Steel Co., at Clairton, Pa. General operations in the coke regions are put at about 10 per cent of normal, the lowest rate of operation reached for many years. One leading coke interest is said to be operating its ovens close to 60 per cent, but this is partly explained by the fact that this concern has some coal mines with bad bottoms, and it is figured out that it is more economical to run its mines and sell the coal or coke at a loss than to close the mines. During the week, a large Eastern consumer of coke is reported to have closed a contract for about 7000 tons a month for July, August and September, with a leading local producer, at \$3 per net ton at oven. Nothing has been done on the inquiries of Thomas Iron Co., Hokendauqua, Pa., for 4000 tons a month, or the Colonial Iron Co., Riddlesburg, Pa., for 7000 tons a month. It is said that \$3 per ton for high grade furnace coke, and a less price for coke not so well known have been quoted, but producers of high grade foundry coke who are still paying the union scale of wages, are holding selected 72-hr. foundry coke at \$5 per ton at oven. Other makes of foundry coke can be bought as low as \$4.50 and some foundry coke, regarded as off grade, is being sold as low as \$4 per ton. There does not seem to be any indication of better prices for either furnace or foundry coke in the near future, and the market may go lower. Several leading operators claim it is costing all of \$3.75 to make high grade furnace coke, and rather than sell at \$3 per ton, they will keep the coal mines closed and conserve the coal for a later time when they can sell their coal or coke at a profit. Mine run steam coal is being sold at \$1.75 to \$2; high grade gas coal, run of mine, at \$2.50 to \$2.75, and screened coal about 25c. per ton higher. It is claimed that high grade coking coal is bringing from \$2 to \$2.50, but it cannot be mined at this price, or put into coke at \$3 per ton. There is a movement under way among some makers of high grade furnace and foundry coke to close down the few ovens they are running for two or three months, and allow other producers to load up at present low prices. However, the movement has not taken definite form.

**Old Material.**—Consumers of scrap in the Pittsburgh and Valley districts are not operating their plants to more than 25 per cent of capacity, and seem to have very heavy stocks of scrap on hand and are not interested at any price in offerings made by dealers. The Allegheny Steel Co., Brackenridge, Pa., ordinarily a large consumer of machine shop turnings, is filled up and not buying at any price, while the West Penn Steel Co., at the same place, also a large consumer, has large offerings of turnings at \$7.75, delivered, but is not buying. It is probable that on a firm offer, machine shop turnings could be bought at \$7.50 per gross ton, delivered. Selected heavy steel scrap is being offered quite

freely at \$13 per gross ton, delivered, but there are no buyers. Local dealers say that they cannot get shipping directions on tonnages of scrap they sold some time ago, the mills being so filled up they do not want to take in any more. Max Solomon, a leading scrap dealer of this city, who was the successful bidder for 22,000 tons shell forgings at Washington, will probably have this material shipped here and store it in his yard. It would be very hard to market it at this time. Local dealers who have been in the scrap business here for 25 or 30 years say that never before have they seen demand so dull as at present. Prices are largely nominal, as there is so little new business moving on which to base actual prices.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh.....	\$13.00 to \$13.25
No. 1 cast cupola size.....	17.00 to 17.50
Re-rolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin, Pa., and Pittsburgh.....	14.00 to 15.00
Compressed sheet steel.....	10.50 to 11.00
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist..	8.50 to 9.00
Railroad knuckles and couplers.....	14.00 to 14.50
Railroad coil and leaf springs.....	14.00 to 14.50
Railroad grate bars.....	11.50 to 12.00
Low phosphorus melting stock, bloom and billet ends, heavy plates, ½-in. and thicker.....	17.50 to 18.00
Railroad malleable.....	12.00 to 13.00
Iron car axles.....	21.00 to 22.00
Locomotive axles, steel.....	18.00 to 19.00
Steel car axles.....	15.00 to 15.50
Cast iron wheels.....	14.50 to 15.00
Roll steel wheels.....	14.00 to 14.50
Machine shop turnings.....	7.50 to 7.75
Sheet bar crop ends, at origin.....	13.00 to 14.00
Heavy steel axle turnings.....	10.00 to 11.00
Short shoveling turnings.....	9.00 to 9.50
Heavy breakable cast.....	14.50 to 15.00
Stove plate.....	12.50 to 13.00
Cast iron borings.....	8.25 to 8.50
No. 1 railroad wrought.....	12.00 to 12.50

## BUSINESS PRACTICES

### Federal Trade Commission Not Ready to Give Information as Proposed

CHICAGO, June 14.—Picturing the Federal Trade Commission as desirous of doing all in its power to aid business, and declaring that the American business man needs no "governmental crutch," Chairman Huston Thompson, of the Commission, delivered a really refreshing address on "Rebuilding Business," before the National Wholesale Grocers' Association, at the Congress Hotel, here last Thursday.

Contrary to the general impression that the commission has been a source of disturbance to business, Chairman Thompson's words were directed in an entirely opposite course. So long as a wholesaler is serving a useful purpose, Chairman Thompson said the commission will do all in its power to see that no obstacles are placed in his way. He expressed the utmost confidence in the "masculinity and upstandingness of the American business man," who does not need to hand over his initiative to the Government to be instructed in advance as to what he can or cannot do. It was insisted that the Government must not be called in to act as a legal guardian.

Apparently, as an answer to suggestions that the commission should pass upon the legality of business practices in advance so as to remove uncertainties from business, Mr. Thompson said that if the Government should attempt to rule in advance on such matters, and to make sound rulings, they would have to be based upon multitudinous possibilities and potentialities of the proposed plans. He pointed out that extensive investigations would be necessary and a large and expensive organization would consume much time and money, which would perhaps be wasted if in actual operation the proposed plans should chance to work out in unforeseen channels. This statement is accepted as indicating that the commission is not in favor of the idea that it should pass upon practices of business in advance, to determine whether or not they are in violation of the law. This expression is contrary to a recent suggestion made by Mr. Hoover.

## Chicago

CHICAGO, June 14.

The past week has been an uneventful one in the iron and steel trade. Buying is at a minimum and so far as steel is concerned consumers generally expect another price reduction by the leading interest and are holding back orders in anticipation of such a development. The railroads openly declare that they will not buy until prices are further reduced. Pig iron has again declined about 50c. a ton, while bolts and nuts are exceptionally weak, but apparently makers are delaying open reductions on the assumption that steel will soon be cut.

Steel plants are operating at about the same rate as a week ago, the only changes being for the worse. The Illinois Steel Co. has blown out one blast furnace at Gary, leaving five active there, two running at South Works and two at Joliet, out of 29 in this district. Its steel output remains in the neighborhood of 30 per cent of normal. The Wisconsin Steel Works has shut down its mills, and has one out of three blast furnaces blowing.

**Pig Iron.**—The ruling market on local No. 2 foundry and malleable ranges from \$21, furnace, for tonnage, to \$21.50 and \$22 for carload lots. Even lower prices are being named on tonnages taken outside of this district, where the competition of nearby furnaces must be met. Thus 500 tons of No. 2 foundry was sold in Ohio at \$20, Chicago furnace. There is only one inquiry of size before the trade. This comes from the St. Paul Railroad and calls for several hundred tons of malleable and 100 tons of No. 1 foundry. About 2000 tons of resale foundry has been put on the market recently. No prices have been named on this iron, but offers have been solicited. The Ohio furnace which has been selling copper free low phosphorus has disposed of all of its stocks except a small tonnage of off grade material. All of the charcoal iron makers are now idle and there is little demand for charcoal in this market. One carload however, was recently sold at \$31, furnace, for the base grade.

Lake Superior charcoal, averaging sil.	
1.50, delivered at Chicago.....	\$37.50
Northern coke, No. 1, sil. 2.25 to 2.75.....	\$21.50 to 22.50
Northern coke foundry, No. 2, sil.	
1.75 to 2.25 .....	21.00 to 22.00
Northern high phos. ....	21.00 to 22.00
Southern foundry, sil. 1.75 to 2.25....	27.67
Malleable, not over 2.25 sil.....	21.00 to 22.00
Basic .....	21.00 to 21.50
Low phos., f.o.b. Birmingham, sil. 1 to	
2 per cent copper free.....	31.00
Silvery, sil. 8 per cent.....	38.53

**Ferroalloys.**—All of the ferroalloys are exceedingly quiet. Among the few inquiries is one from the American Steel Foundries for one carload of ferromanganese. The same company wants a carload of manganese ore.

We quote 78 to 82 per cent ferromanganese, \$80 delivered; 50 per cent ferrosilicon, \$80 delivered; spiegeleisen, 18 to 22 per cent, \$37 to \$38 delivered.

**Plates.**—The Petroleum Iron Works Co., Sharon, Pa., has been awarded the contract for the fabrication of four 55,000-barrel oil storage tanks for the Sinclair Refining Co. at Florence, Kan. The work will involve about 800 tons of light plates or heavy gage sheets. The Graver Corporation, Chicago, will fabricate tanks and refining apparatus for the Indiana Oil Refining Co., Columbus, Ind., requiring 740 tons of steel. A Chicago fabricator is bidding on tank work in Canada, which calls for 350 tons of plates. Outside of these projects, there is no new tank work to report. Inquiry for plates generally is very light and while the market is unsteady, some mills are still adhering strictly to 2.20c., Pittsburgh.

The mill quotation is 2c. to 2.20c. Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.23c. for plates out of stock.

**Structural Material.**—Resumption of building operations in Chicago seems assured with the appointment of Federal Judge Landis as umpire in the dispute between contractors and unions. Except for this favorable development, nothing has transpired to indicate a change in a dull market. Fabricators continue to book small jobs here and there, but not enough to keep their shops busy. Bids were taken Saturday on a Masonic temple at Detroit involving 7000 tons, but no award has yet been reported. Some mills continue to ask 2.20c., Pittsburgh, for plain material, but the trend of

the market is indicated by the fact that one important fabricator is figuring on the business of securing plates at 2c., Pittsburgh, and plain material at 2.10c. Recent fabricating awards include:

State of South Dakota, seven 150-foot spans, Eagle Butte, Ziebeck County, 410 tons, to Northwestern Bridge & Iron Co. Superior Coal & Dock Co., coal handling bridge, Duluth, 308 tons, to Brown Hoisting Machinery Co.

Wisconsin State Highway Commission, highway spans in Wood County, 150 tons, to Worden-Allen Co.

H. M. Bylesby Co., Chicago, transmission towers for lines in Wisconsin and Minnesota, 150 tons, to Worden-Allen Co.

Public schools, Chicago, one involving 300 tons, to Hansell-Elcock Co.; another involving 400 tons, to Union Foundry Works.

Grand Avenue Station, Northwestern Elevated Railroad, Chicago, 165 tons, to Hansell-Elcock Co.

World Theater, Omaha, Neb., 350 tons, to Decatur Bridge Co.

Cattle barn, State Fair Grounds, St. Paul, Minn., 200 tons, to St. Paul Foundry Co.

## Current inquiries include:

Devore & Co., Toledo, will receive bids Thursday on 1,000 tons for a window glass plant at Shreveport, La., for the United States Window Glass Co.

United States Board of Engineering for Rivers and Harbors, dock building, St. Louis, 150 tons.

Public school, Boise, Idaho, 100 tons.

High school, Salt Lake City, Utah, 190 tons.

Gallup-American Coal Co., Salt Lake City, 200 tons for coal tippie at Gallup, N. M.

Louisville & Nashville Railroad, roundhouse, Hazard, Ky., 175 tons, Joseph E. Nelson & Sons, Chicago, general contractor.

Board of commissioners, Port of New Orleans, marine log unloader, 233 tons.

The mill quotation is 2.20c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.23c. for materials out of warehouse.

**Rails and Track Supplies.**—The market is decidedly quiet, among the few inquiries being one from the Chicago & Northwestern for 250 kegs of spikes.

Standard Bessemer rails, \$45; open-hearth rails, \$47; light rails rolled from new steel, 2.20c. f.o.b. makers' mills.

Standard railroad spikes, 3.20c. to 3.40c., Pittsburgh; track bolts with square nuts, 4.20c. to 4.35c., Pittsburgh; steel tie plates, 2.50c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.50c. to 3c. f.o.b. makers' mills.

**Bolts and Nuts.**—The discounts published on page 1657 are nominal so far as this district is concerned, current prices being almost as numerous as are the makers. Jobbers serving the farm trade are buying more than those dependent on manufacturing trade, but no large orders are coming from any source. The weakness in prices has been reflected in a reduction in bolts by local warehouses, the new discounts of which are published below.

Jobbers quote structural rivets, 4.53c.; boiler rivets, 4.63c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 60 per cent off; larger sizes, 50 and 5 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 50 off; larger sizes, 50 off; hot pressed nuts, square and hexagon tapped, \$2.10 off; blank nuts, \$2.60 off; coach or lag screws, gimlet points, square heads, 55 and 5 per cent off. Quantity extras are unchanged.

**Bars.**—The demand is light and prices are unsteady, although some mills continue to quote 2.10c., Pittsburgh, on soft steel bars. Business is being taken, however, at 2c., 1.90c. and 1.85c. It is felt by many that price stability will not come until open reductions are made by the leading makers or an unexpected turn in the demand develops. Buying of bar iron is light and the character of the market may be gaged by the fact that the principal current inquiry calls for 75 tons. The two foremost bar iron mills are still idle. Although there is little business to test prices, the ruling quotation appears to be 2.25c., Chicago. The main hope for bar business lies in purchases by the railroads. Although the carriers have frequently failed to do what was expected of them, it is felt that a heavy repair program will soon be inaugurated. In this connection it is pointed out that freight movement is increasing, particularly grain traffic, and that some lines are actually experiencing a shortage of some classes of equipment. There has been no turn for the better in the demand for rail carbon steel bars.

Mill prices are: Mild steel bars, 2.10c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 2.25c. Chicago; rail carbon, 2c., mill or Chicago.

Jobbers quote 3.13c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars is 4.63c. for rounds and 50c. extra for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.88c. base.



**Cast-Iron Pipe.**—Inquiry has fallen off and awards are fewer, but it is stated in some quarters that much municipal work is in the course of preparation and has not yet reached the stage of asking for bids. The recent reduction in prices did not bring stability to the market. On the contrary, prices named vary from \$42 to \$45, Birmingham and above, depending on the character of the business. Recent awards include:

Lake Mills, Wis., 100 tons, to James B. Clow & Sons.  
Government work, Port Clinton, Ohio, 200 tons, to National Cast Iron Pipe Co.

Pending work includes:

Manitowoc, Wis., 50 tons, bids to be taken June 20.

Erie, Ill., 250 tons, let to contractor who will sublet.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., \$57.10; 6-in. and above, \$54.10; class A and gas pipe, \$3 extra.

**Sheets.**—German mills are underselling Americans in the Orient. This applies not only to sheets but other steel products. The domestic market for sheets remains very quiet and more is heard of price concessions. As low as 4.75c., Pittsburgh, has been done on galvanized, while black has sold at 3.80c., Pittsburgh, and blue annealed at from 2.95c. to 3c., Pittsburgh.

Mill quotations are 3.80c. to 4c. for No. 28 black; 2.95c. to 3.10c. for No. 10 blue annealed and 4.75c. to 5c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 4.13c.; No. 28 black, 5.40c.; No. 28 galvanized, 6.40c.

**Wire Products.**—The reduction in prices has brought out more orders for rush shipment, but it is apparent that jobbers are not yet willing to lay in stocks. Improvement is noted in business coming from the Northwest, Iowa, Michigan and Ohio, and even in the South conditions are slightly better. Nails are being bought in the largest volume, but there is also a brisk seasonal movement of hay bale ties. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1657.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, \$3.63 per hundred pounds; No. 9 and heavier bright basic wire, \$3.78 per hundred pounds; common wire nails, \$3.73 per hundred pounds; cement coated nails, \$3.15 per keg.

**Old Material.**—Consumers continue to buy sparingly, but such purchases as have been made indicate lower prices. Thus 500 tons of heavy melting was bought at \$11.50 per gross ton, 250 tons of No. 1 railroad wrought at \$10 per net ton, 250 tons of No. 2 wrought at \$9.75, and 200 tons of carwheels at \$13.75 per gross ton. In view of the weak condition of the market, railroad offerings are not being absorbed as fast as a few weeks ago. Current lists are of liberal proportions and include the Louisville & Nashville, 16,000 tons, the Rock Island 3500 tons, the Northern Pacific 2500 tons, the Pere Marquette 2000 tons and the Soo Line 300 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$16.50 to \$17.00
Relaying rails	30.00 to 35.00
Car wheels	13.25 to 13.75
Steel rails, rerolling	13.00 to 13.50
Steel rails, less than 3 ft.	13.00 to 13.50
Heavy melting steel	11.00 to 11.50
Frogs, switches and guards, cut apart	11.00 to 11.50
Shoveling steel	10.50 to 11.00
Low phos. heavy melting steel	14.00 to 14.50
Drop forge flashings	7.50 to 8.00
Hydraulic compressed sheet	7.00 to 7.50
Axle turnings	7.50 to 8.00
Per Net Ton	
Iron angles and splice bars	14.50 to 15.00
Steel angle bars	11.00 to 11.50
Iron arch bars and transoms	14.00 to 14.50
Iron car axles	19.50 to 20.00
Steel car axles	13.00 to 13.50
No. 1 busheling	8.50 to 9.00
No. 2 busheling	6.00 to 6.50
Cut forge	9.50 to 10.00
Pipes and flues	6.50 to 7.00
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	9.50 to 10.00
Steel knuckles and couplers	12.00 to 12.50
Coil springs	12.00 to 12.50
No. 1 machinery cast	13.00 to 13.50
Low phos. punchings	11.00 to 11.50
Locomotive tires, smooth	10.50 to 11.00
Machine shop turnings	3.50 to 4.00
Cast borings	5.00 to 5.50
Stove plate	12.00 to 12.50
Grate bars	10.50 to 11.00
Brake shoes	10.50 to 11.00
Railroad malleable	11.50 to 12.00
Agricultural malleable	11.50 to 12.00
Country mixed	7.50 to 8.00

## Buffalo

BUFFALO, June 14.

**Pig Iron.**—There is little doubt that the Buffalo market has reached the lowest ebb since the inception of the slump in business. With two factors reporting no sales comes the announcement from a producer that with the completion of orders now on hand, its only furnace now in blast will be blown out. It is frankly stated the price situation is responsible for the declaration—not fewer sales. Sales of 2500 tons at \$24 base are reported. Shipping on old contracts still goes on. A number of carload sales were made by a producer and in each instance the price was arranged—mostly at a \$23 base level. The same interest has inquiries aggregating 2500 tons for the week, a few being for third quarter delivery. Future delivery inquiry is no more attractive than heretofore.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	\$25.00 to \$26.00
No. 2X foundry, 2.25 to 2.75 sil	24.00 to 25.00
No. 2 plain, 1.75 to 2.25 sil	23.00 to 24.00
Basic (nominal)	21.00 to 22.00
Malleable (nominal)	23.00 to 24.00
Lake Superior charcoal	37.00

**Warehouse Business.**—The trend of business in this vicinity is without feature. The latter days of the week, one warehouse booked a fair assortment of orders, but nothing has occurred that would mark a departure from the dullness which has existed for many weeks. Price reductions on the minor lines did not bring out any business. While one warehouse reports a better business in structural materials than in anything else, another finds it hard to distinguish a better movement on one line than another. An idea of the kind of competition warehouses are meeting is found in the experience of a salesman who quoted on a 6-ton plate order and learned from the prospective buyer that he had been quoted the equivalent of mill prices on the tonnage mentioned.

**Finished Iron and Steel.**—With the exception of a few jobs in the hands of fabricators, the market is dead. The mill interests are united in the declaration that business could not reach a lower level. One company has booked the lowest tonnage for one week since it established a Buffalo office. Opinion is general that lower prices will develop soon and rumors of price shading continue. However, no tonnage of sufficient size has come out to test the market. A factor holding up a drastic price cut is the reluctance of mill interests to embarrass jobbers who have bought stocks at higher prices, the tendency being to afford jobbers a chance to unload as much as possible. Mill interests say business is taken with the view of minimizing losses—the question of profit has been abandoned. Every ton turned out by mills is sold at a loss. One hopeful sign is that production does not equal sales.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 3.25c.; plates, 3.25c.; plates, No. 8 gage, 4.10c.; soft steel bars and shapes, 3.15c.; hoops, 3.85c.; blue annealed sheets, No. 10 gage, 4.15c.; galvanized steel sheets, No. 28 gage, 6.30c.; black sheets, No. 28 gage, 5.30c.; No. 9 gage annealed wire, 4.35c.; cold rolled strip steel, 8.15c.

**Old Material.**—Offerings of borings by a few automobile plants have not been accepted by local dealers. The market is worse in the opinion of one dealer, than at any time this year. The little done is between dealers and nothing is going to consumers. June railroad lists are normal. The sale of shell forgings to a Pittsburgh dealer by the Government interested but one Buffalo dealer; the others not caring to handle a tonnage of the size offered.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$12.50 to \$13.00
Hydraulic compressed	9.00 to 9.50
Low phos., 0.04 and under	17.00 to 18.00
No. 1 railroad wrought	13.00 to 14.00
Car wheels	16.00 to 17.00
Railroad malleable	11.50 to 12.50
Machine shop turnings	7.00 to 8.00
Heavy axle turnings	10.00 to 11.00
Clean cast borings	7.00 to 8.00
Locomotive grate bars	11.50 to 12.50
Wrought pipe	9.50 to 10.50
No. 1 busheling	9.50 to 10.50
Stove plate	15.00 to 16.00
Bundled sheet stampings	7.00 to 8.00
No. 1 machinery cast	18.00 to 18.50

## Boston

BOSTON, June 14.

**Pig Iron.**—The market for eastern Pennsylvania and Buffalo irons appears easier without appreciable increase in actual business or prospects. Certain it is differentials of \$1.25 on silicon have virtually disappeared. The most common differential on all irons, in fact, is now \$1, and 50c. was named this week. One eastern Pennsylvania furnace is reported having offered a Massachusetts stove maker silicon 1.75 to 2.25 at \$21.50 and silicon 2.25 to 2.75 at \$22, while Buffalo iron was offered at \$23 and \$23.50 respectively, furnace. It also is certain the spread in Buffalo furnace quotations is narrower, and the same is true of Pennsylvania with one exception, which is several dollars above the others. Actual sales the past week, however, were confined to perhaps a half dozen cars, and inquiries embrace about as many, including the Howe Scale Co., Rutland, Vt., for a car of charcoal iron. In greater Boston, foundries appear to hold their own or do slightly better. Elsewhere in New England reports are less encouraging. Delivered prices follow:

East. Penn., silicon 2.25 to 2.75.....	\$28.06 to \$29.06
East. Penn., silicon 1.75 to 2.25.....	27.06 to 28.06
Buffalo, silicon 2.25 to 2.75.....	29.46 to 30.46
Buffalo, silicon 1.75 to 2.25.....	28.46 to 29.46
Virginia, silicon 2.25 to 2.75.....	33.58 to 35.83
Virginia, silicon 1.75 to 2.25.....	32.58 to 33.58
Alabama, silicon 2.25 to 2.75.....	33.66 to 34.16
Alabama, silicon 1.75 to 2.25.....	33.16 to 33.66

**Coke.**—New England producers of foundry coke announce a basis on which they will accept business for the last half of 1921. The New England Coal & Coke Co., due to the uncertainty of the future, finds it impossible to determine a set price and therefore will accept business only at price ruling date of shipment. The Providence Gas Co. issues notice that shipments during any month in the last half of 1921 will be invoiced at Providence ovens on a basis of \$11.26 per ton f.o.b. destination, but, should the average between the minimum and maximum price for spot shipments of Connellsville foundry coke for any month exceed \$5 per net ton ovens, Connellsville, the company's price shall be increased by an amount equal to such excess. The company's price applies only on shipments where the \$6.16 Connellsville freight applies. The company further states that if customers do not care to place business on this basis, it will accept orders at price ruling date of shipment. Otherwise, both companies are doing business on a basis of \$11.41 delivered for spot foundry coke and \$11.16 for contract fuel. A textile machinery interest this week purchased 300 tons spot coke and releases on contract bring going business for the week up to possibly 2000 tons. New England foundry coke supplies are down to comparatively small proportions. Owing to the lack of prospective business and possibilities of shutdowns in July, however, they are in no hurry to place orders with producers. So far this month, shipments by the New England Coal & Coke Co. have averaged about 20 per cent of those for the corresponding period last year. While figures are not available, it is understood the records of the Providence Gas Co. are equally low.

**Warehouse Business.**—A moderate amount of iron and steel was moved this week, but each ton sold included a large number of orders. The demand for bolts and nuts is holding its own. Certain makers of semi-finished nuts with S A E threads are reported as having cut prices 10 per cent, and of cap and lag screws, as much, but the practice is not general.

Jobbers now quote: Soft steel bars, \$3.18 per 100 lb. base; flats, \$4.18 to \$4.28; concrete bars, \$3.18 to \$3.45½; tire-steel, \$4.25 to \$4.75; spring steel, open hearth \$5.50; crucible, \$11.50; steel bands, \$3.83 to \$4.48; steel hoops, \$4.38; toe calk steel, \$5.25; cold rolled steel, \$4.65 to \$5.15; structural, \$3.18 to \$3.28; plates, \$3.28 to \$3.50; No. 10 blue annealed sheets, \$4.53; No. 28 black sheets, \$5.85; No. 28 galvanized sheets, \$6.85; refined iron, \$3.18 to \$5; best refined, \$5; Wayne iron, \$8.50; Norway iron, round, ¼-in. to 2½-in., 8c. per lb. net; other sizes, 10c. base.

**Finished Material.**—The New York, New Haven & Hartford Railroad is asking bids on several hundred tons of open hearth bars as well as a round tonnage of plates, angles and channels to apply on repairs for 1000 freight cars, delivery of material to be at Sagamore, Mass. The Lackawanna Bridge Co., Buffalo, was awarded 600 tons structural for the Great Northern Paper Co., Millinock, Me., plant, and the Boston Struc-

tural Steel Co., Inc., 320 tons for the Newhall apartments, Brookline, Mass. The New England Structural Steel Co. has secured a release on 350 tons for a Montpelier, Vt., power house job, which was held up. The steel will be taken from stock at Everett. D. C. Burpee & Sons, South Devon, Brunswick, Can., recently was awarded 950 tons for an international bridge from Madawaska, Me., to Edmundston, N. B. Mills in general hold at 2.20c., Pittsburgh, on structural steel, although 2c. has been offered. An Eastern shipyard bought 200 tons of plates at 2.20c., Pittsburgh. Inquiries for reinforcing bars include 200 tons for a Stoughton, Mass., road and approximately 500 tons for a Portland, Me., project. New England jobbers are obliged to buy only occasionally, and in ordering a car of either iron or steel are likely to include a wide variety of sizes.

**Old Material.**—Machinery cast is easier in the absence of orders and greater competition among dealers. It is now available at \$17 to \$17.50 delivered, even at points as far north as Biddeford, Me. A dealer purchased 100 tons of textile cast at \$14 on cars shipping point, a new low record for this class of scrap. Continued buying of stove plate by a railroad supply manufacturer has served to hold prices firm. As high as \$9 was paid this week for a car of No. 1 heavy melting steel by a dealer to apply to a back order, but this price is all of \$2 above the market. A Rhode Island horse shoe maker bought about 500 tons railroad wrought at \$16 delivered this week, while a Wareham, Mass., maker is in the market for two cars No. 1 yard wrought. Pennsylvania mills are taking bundled skeleton and cast iron borings for storage purposes, and will take heavy melting steel at around \$11 delivered, but are securing comparatively little material. A small tonnage of relaying rails was bought by a Fall River, Mass., interest at 1c. per lb. f.o.b. point near Plymouth, Mass.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast .....	\$17.00 to \$17.50
No. 2 machinery cast .....	15.00 to 16.50
Stove plate .....	15.00 to 16.00
Railroad malleable .....	14.00 to 15.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$6.50 to \$7.00
No. 1 railroad wrought.....	10.00 to 10.50
No. 1 yard wrought.....	8.50 to 9.00
Wrought pipe (1-in. in diameter, over 2 ft. long).....	7.00 to 7.50
Machine shop turnings.....	3.00
Cast iron borings, rolling mill.....	3.00
Cast iron borings, chemical.....	3.00 to 3.50
Blast furnace borings and turnings..	3.00
Forged scrap and bundled skeleton..	5.00 to 5.50
Street car axles and shafting .....	12.00 to 12.50
Car wheels .....	11.50 to 12.00
Rerolling rails .....	9.00 to 10.00

## Birmingham

BIRMINGHAM, ALA., June 14.

**Pig Iron.**—All Birmingham iron makers deny selling 25,000 tons or any large tonnage recently to the National Cast Iron Pipe Co. or any other company. The National company also enters specific denial to having made any recent large purchase. A lot of 100 tons of Birmingham iron was sold at \$23.50 for silicon 2.75 to 3.25. This shows how the silicons operate on a \$22.50 base. It is a differential of 50c. for each of the higher silicons. A lot of 250 tons for Southern consumption was sold for \$22. This last price is the base for lots as high as 200 tons with the average maker. The market has ranged from \$22 to \$22.50 with 50c. differentials according to most reliable exponents of the market. Prevailing business has been for small tonnage for prompt delivery. Stocks on yards June 1 and May 1 compared were: Foundry, 132,000 and 139,000 tons; machine cast, 44,000 and 37,000; basic, 59,000 and 45,000; totals, 235,000 and 221,000. Local iron melt is picking up owing to larger operations at stove and radiator plants. Export rates on pig iron by rail to coast have been reduced to \$2.75, but there is no inquiry.

We quote per gross ton f.o.b. Birmingham district furnace, as follows:

Foundry, sil. 1.75 to 2.25.....	\$22.00
Basic .....	21.00
Charcoal .....	35.00



**Finished Material.**—Shipment out of Mobile of 10,000 tons of rails for Alaskan railroads is being made. One large structural steel works has taken orders for three bridges for the Philippines, office building at Miami, Fla., river terminal at Demopolis on the Warrior River, Ala., and industrial buildings and bridges in Mississippi, Virginia and Louisiana. The Tennessee company has resumed its structural mill at Fairfield and is operating at more than 50 per cent of ingot capacity.

**Cast Iron Pipe.**—High pressure pipe orders have not followed the reduction to \$45 level. The National Cast Iron Pipe Co. is operating at 60 per cent, which is about as high as any. The \$40 level for soil pipe has stopped price-cutting, makers not being willing to manufacture under that figure.

**Old Material.**—In the absence of transactions, prices quoted are nominal. Some cast has moved to high pressure pipe shops, which are using more of it than heretofore and find it satisfactory.

We quote per gross ton f.o.b. Birmingham district yard as follows:

Old steel rails.....	\$10.00 to \$11.00
No. 1 steel.....	9.00 to 10.00
No. 1 cast.....	16.00 to 17.00
Car wheels.....	16.00 to 17.00
Tramcar wheels.....	15.00 to 16.00
No. 1 wrought.....	13.00 to 14.00
Stove plate.....	9.00 to 10.00
Cast iron borings.....	6.00 to 7.00
Machine shop turnings.....	6.00 to 7.00

## Philadelphia

PHILADELPHIA, June 14.

Extreme apathy among buyers still marks the iron and steel market, the past week having been one of the dulllest of the year. Eastern steel companies making plates and shapes note a slight revival of interest in structural work, and this may be said to be the only change in the situation. Among the larger projects are a Masonic Temple building in Detroit, requiring 7000 tons, 25 tanks for the Sinclair Consolidated Oil Corporation, involving 3600 tons of steel, mostly plates, and a steel pipe job at Akron, Ohio, 1600 tons.

**Pig Iron.**—Two sales of 500 tons each and another of 150 tons of foundry iron are the only sales of importance reported for the past week. There is a dearth of inquiry, and business for the week was mostly in carload lots. Eastern furnaces are quoting \$24 for No. 2 plain, \$25 for No. 2 X and \$26 for No. 1 X, f.o.b. furnace. In the northern section of the Eastern territory, the furnaces of this district are now meeting more active competition from Buffalo. Prices named at Buffalo have been as low as \$21 and \$22, furnace, and in some instances where the freight rate from Buffalo is not too high, these quotations have been attractive enough to take the business. An inquiry has been received for 1300 tons of No. 2 X iron for export, but doubt is expressed that the business can be closed in competition with Belgian iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to \$1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25...	\$24.75 to \$25.25
East. Pa. No. 2X, 2.25 to 2.75 sil....	25.50 to 26.25
Virginia No. 2 plain, 1.75 to 2.25 sil....	31.74
Virginia No. 2X, 2.25 to 2.75 sil....	32.99
Basic deliv. Eastern Pa.....	25.00
Gray forge.....	25.26
Standard low phos. (f.o.b. furnace)...	38.00
Malleable.....	28.00 to 29.00
Copper bearing low phos. (f.o.b. furnace)	35.00

**Ferroalloys.**—There is no demand of importance for ferromanganese or spiegeleisen. The former is quoted at \$80, delivered, by domestic producers and at \$75, seaboard, by agents of the British producers. Spiegeleisen is obtainable at \$30, furnace.

**Coke.**—Furnace coke has been sold at \$3.10, Connellsville, for the first grade. Foundry coke is quoted at \$5, Connellsville.

**Semi-Finished Steel.**—Inquiry for billets is almost negligible and price quotations remain unchanged, namely \$37 for rerolling quality and \$42 for forging quality, f.o.b. Pittsburgh.

**Plates.**—The plate market continues weak, but without enough inquiry to test prices. On carload lots, 2c.,

Pittsburgh, is being regularly done, but this price undoubtedly would be shaded on an attractive inquiry. A good many of the current orders are for less than carload lots, on which quotations are usually 2.20c., Pittsburgh. The only inquiries of importance in the market are for 3600 tons of steel, mostly plates, for 25 tanks required by the Sinclair Consolidated Oil Corporation, and 1600 tons of plates for a pipe job at Akron, Ohio. We quote universal and sheared plates at 2c. to 2.20c., Pittsburgh.

**Structural Material.**—Eastern mills have quoted on the plain material for a 7000-ton Masonic Temple project in Detroit. Docks and terminals at Wilmington, Del., requiring 1200 tons, are also up for bids. Three War Department balloon hangars, totalling about 300 tons, went to Belmont Iron Works. We quote plain material at 2.20c., Pittsburgh.

**Bars.**—There is very little demand for soft steel bars, but an occasional inquiry for reinforcing bars is being quoted upon. Bar iron prices are soft, quotations of 1.85c., Pittsburgh, having been made. We quote soft steel bars at 2.10c. and bar iron at 1.90c., Pittsburgh.

**Sheets.**—Softness in sheet prices is not so apparent as in other districts. Eastern mills are apparently holding to the schedule of 3.10c. for blue annealed, 4c. for black and 5c. for galvanized, f.o.b. Pittsburgh.

**Warehouse Business.**—We quote the following prices for steel out of local jobbers' stocks for delivery in the immediate Philadelphia district. For shipment out of town reductions of \$2 or more a ton are granted to offset shipping charges.

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3c.; round edge iron, 3.30c.; round edge steel, iron finish, 1½ in. x ½ in., 3.50c.; round edge steel, planished, 4.25c.; tank steel plates, ¼-in. and heavier, 3.30c.; tank steel plates, 3/16-in., 3.52c.; blue annealed steel sheets, No. 10 gage, 4.20c.; light black steel sheets, No. 28 gage, 5c.; galvanized sheets, No. 28 gage, 6c.; square twisted and deformed steel bars, 3.20c.; structural shapes, 3.30c.; diamond pattern plates, ¼-in., 5.05c.; 3/16-in., 5.27c.; ½-in., 5.37c.; spring steel, 5c.; round cold-rolled steel, 4.60c.; squares and hexagons, cold-rolled steel, 5.10c.; steel hoops, No. 13 gage and lighter, 3.85c.; steel bands, No. 12 gage to 3/16-in. inclusive, 3.85c.; iron bands, 4.30c.; rails, 3.20c.; tool steel, 12c.; Norway iron, 8c.; toe steel, 4.50c.

**Bolts, Nuts and Rivets.**—A further reduction in prices on bolts and nuts has been announced by Eastern makers and new schedules on rivets will be put out in a few days, the new prices applying to third quarter contracts. Machine bolts, ¾ x 4 in. and smaller, and shorter rolled threads are now 70 and 7½ per cent off list; cut threads, 65 and 10 per cent off and larger and longer, 60 and 10 per cent off. Other prices are proportionately reduced.

**Old Material.**—The scrap market, always extremely sensitive to outside influences, has been in a somewhat nervous state during the past week, due to the depressed situation in the securities market. There has been no improvement in the demand and prices remain easy. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$11.50 to \$12.00
Scrap rail.....	11.00 to 11.50
Steel rails, rerolling.....	14.00 to 15.00
No. 1 low phos., heavy 0.04 and under.....	17.00 to 18.00
Car wheels.....	18.00 to 19.00
No. 1 railroad wrought.....	15.00 to 16.00
No. 1 yard wrought.....	14.00 to 15.00
No. 1 forge fire.....	10.00 to 10.50
Bundled sheets (for steel works)....	8.00 to 8.50
No. 1 busheling.....	12.00 to 12.50
No. 2 busheling.....	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use).....	8.00 to 8.50
Mixed borings and turnings (for blast furnace use).....	8.00 to 8.50
Machine-shop turnings (for rolling mill and steel works use).....	8.50 to 9.00
Heavy axle turnings (or equivalent).....	10.00 to 11.00
Cast borings (for rolling mills)....	9.50 to 10.00
Cast borings (for chemical plants)....	10.50 to 11.50
No. 1 cast.....	17.50 to 18.00
Railroad grate bars.....	12.50 to 13.00
Stove plate (for steel plant use)....	12.50 to 13.50
Railroad malleable.....	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)....	13.00 to 13.50
Iron car axles.....	No market
Steel car axles.....	No market

## Philadelphia Steel Club Disbands

The Steel Club of Philadelphia, organized about two years ago by the district sales managers of steel companies, was disbanded by unanimous vote of the members at a meeting held on Tuesday, June 14.

## Cincinnati

CINCINNATI, June 14.

**Pig Iron.**—There have been few developments in the market during the week. The Standard Sanitary Mfg. Co. bought 500 tons of Southern iron for prompt delivery to its Louisville, Ky., plant, and the National Cash Register Co. took 160 tons of Southern for its Dayton plant. The latter company is expected to close for an equal amount of Northern iron in a few days. A sale of 500 tons of iron from a northern Ohio furnace is reported to a melter in this territory, but the price was not disclosed. A round tonnage of high silicon iron, taken by a melter with a high priced contract was in the nature of an averaging up proposition, the deliveries of the additional tonnage to be made car for car with the higher priced material. There is practically no inquiry from this territory. One for 500 tons of malleable from a melter in the St. Louis district was circulated last week, but later withdrawn. Southern Ohio iron is still being quoted at \$23, Ironton, for the base grade. On Southern iron, while \$22 still remains the market for carload lots, it is intimated that on a round tonnage lower prices can be done and it is reported that one furnace at least has already quoted \$21.50. Some activity is noted in alloys, and we note a sale of three cars of ferromanganese on the basis of \$78, delivered. Several other carload sales are reported. Belfont stack at Ironton was blown out on Thursday. A local foundry has been asked to bid on castings for the New York harbor tunnel, involving approximately 150,000 tons of castings.

Based on freight rates of \$4.50 from Birmingham and \$2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	\$26.00
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	26.50
Ohio silvery, 8 per cent sil.	38.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	25.52
Basic, Northern	25.52
Malleable	26.52

**Finished Material.**—The market continues extremely quiet and the orders booked consist mostly of carloads and less than carload lots. A fair number of inquiries, however, are being received, but these are more in the nature of feelers than actual indications of a desire to buy. Some activity is, however, noticed in pipe and some fair specifications have been received during the week. Interest is also shown in reinforcing bars, and future business from this source is expected to be fairly good. Inquiries have been received for blue annealed and black sheets and a number of sales made at the stabilized price of 3.10c. and 4c. respectively. Reports are commonly heard of substantial shading in prices, but these are very difficult of confirmation. In the structural field, some activity is noted from Southern points. Bids will be closed this week for 750 tons of steel for the Masonic temple at Birmingham, Ala. An office building at Miami, Fla., involving about 600 tons, is also up for bids. Another project to be revived is a 14-story office building for the First National Bank, Ashland, Ky. It is expected that bids will be asked for this within the next few weeks. Bids for the Stadium at Ohio State University, will close June 24, an extension of one week having been granted to allow a number of companies to prepare their estimates. The Reliance Engineering Co., Cincinnati, has plans under way for an arcade to be built in Hamilton, Ohio, to contain 58 stores and to be 2-stories. Middletown, Ohio, has provided for the issuance of \$600,000 in bonds to take care of the erection of a 12-room grade school, costing \$100,000, and a high school building costing \$500,000. The Martinsville Springs Hotel & Sanitarium Co. has been incorporated at Indianapolis with a capitalization of \$1,250,000 for the purpose of building a large hospital and health resort at Martinsville, Ind. The Business Mens' Club, Cincinnati, which has plans ready for its new home to cost approximately \$1,500,000, has decided not to proceed with the work for the time being. The Big Four Railroad is asking bids on 200,000 tie plates for 105-lb. Dudley rail; 175,000 tie plates for 90-lb. A. S. C. E. rail, and 48,000 tie plates for 80-lb. A. S. C. E. rail. Immediate delivery is requested. Bids will be opened at 12 o'clock noon on June 20, at the office of W. J. Hiner, purchasing agent, Cincinnati.

**Warehouse Business.**—Local jobbers state that business is still being conducted on a hand-to-mouth basis. Buyers apparently expect lower prices to develop in the near future and are now only placing orders for immediate needs.

Iron and steel bars, 3.35c. base; hoops and bands, 4.05c. base; shapes, 3.45c. base; plates, 3.45c. base; reinforcing bars, 3.42½c. base; cold rolled rounds, 1½ in. and larger, 4.85c.; under 1½ in. and flats, squares and hexagons, 5.35c.; No. 10 blue annealed sheets, 4.35c.; No. 28 black sheets, 5.50c.; No. 28 galvanized sheets, 6.50c.; wire nails, \$3.60 per keg base; No. 9 annealed wire, \$3.60 per 100 lb.

**Coke.**—Inquiries and sales in the coke market are confined to carload lots. Prices, if anything, are softer, Connellsville furnace being available at from \$2.75 to \$3.50, with foundry running between \$4 and \$5. Wise County and New River foundry are unchanged at \$7 and \$9 respectively.

**Old Material.**—The scrap market is stagnant and dealers are only buying to fill old contracts. Very little material is moving, a nearby pipe company being about the only one taking in material. The Big Four, B. & O. and the L. & N. railways have lists out. Prices are unchanged.

We quote dealers' buying prices:

	Per Gross Ton
Bundled sheets	\$7.50 to \$8.50
Iron rails	16.50 to 17.50
Relaying rails, 50 lb. and up	30.50 to 31.50
Rerolling steel rails	11.50 to 12.50
Heavy melting steel	10.00 to 11.00
Steel rails for melting	10.50 to 11.50
Car wheels	14.00 to 15.00

	Per Net Ton
No. 1 railroad wrought	10.00 to 11.00
Cast borings	5.00 to 5.50
Steel turnings	3.50 to 4.00
Railroad cast	13.50 to 14.50
No. 1 machinery	13.50 to 14.50
Burnt scrap	8.00 to 9.00
Iron axles	20.00 to 20.50
Locomotive tires (smooth inside)	10.00 to 11.00
Pipes and flues	7.50 to 8.00

## New York

NEW YORK, June 14.

**Pig Iron.**—A Connecticut consumer of foundry iron has offered to buy 5000 tons if a substantial reduction in price were made and 5000 tons more if the iron can be held for a satisfactory period in furnace yards for future delivery. This offer is one of many evidences of the pressure that is being brought to bear to obtain lower prices and even the most optimistic sellers expect to see further concessions. While the volume of business is very small, the number of orders is slightly larger. Prices are weak and the sale of 300 tons of Buffalo No. 2X was made at a \$22 base to a New York consumer. The iron may come by barge. As an example of how silicon differentials are not being maintained the sale of about 300 tons of Buffalo iron, 2.75 to 3.25 silicon, at \$21.75 furnace is cited. One consumer is offering \$20 for his iron and is confident of being able to buy at that price. One firm reports as many orders as in prosperous times and states that the tonnage is small. On a recent inquiry from a New Jersey melter who decided not to buy, the low bid was \$20.75 Buffalo for No. 2 plain.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$5.46 from Buffalo and \$6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	\$27.52 to \$28.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	26.52 to 27.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	25.52 to 26.52
Buffalo, sil. 1.75 to 2.25	27.46 to 28.46
No. 2 Virginia, sil. 1.75 to 2.25	30.16 to 31.16

**Finished Iron and Steel.**—Prices of steel products remain nominally unchanged on domestic business, but this situation exists solely because of the lack of attractive inquiry. Evidence of willingness of steel mills to cut below present schedule is afforded by concessions offered on export orders. An order for 1800 tons of structural shapes for Japan was placed by a large Japanese house at a price reported to be about 1.90c., Pittsburgh, \$6 a ton below the price which is being done on current small lots of plain material. Tin plate has been sold for export at \$1 per base box below the domestic price. Plates are the weakest of any of the rolled products. A single carload was sold last week at about 1.80c. or 1.85c., Pittsburgh. Most of the orders average hardly a carload, and the usual prices are 2c.



for carloads and 2.20c. for less than carloads. Further weakness appears in bar iron, which is nominally quoted at 1.90c., Pittsburgh, but 1.85c. is said to have been done. In structural work and in prospective car repair work there are slightly improved prospects. Generally there is nothing on the horizon to indicate a betterment during the summer months. The railroads, in preparation for the crop moving season, are figuring on repairs to old cars, and several orders of this character may soon be closed. The Chesapeake & Ohio has asked for bids on repairing 500 to 1500 composite gondolas and 500 to 1000 steel gondolas; the Wabash Railroad may order repairs on 300 hopper cars and the Missouri Pacific is considering repairs on 2000 cars of various types. The Illinois Central has 1000 cars to be repaired and the contract may be closed shortly. The Erie Railroad has ordered 1000 box cars from the Standard Steel Car Co. and the Great Northern has ordered 500 wood refrigerator cars from the General American Tank Car Co. New structural jobs include the following: Coal breaker near Scranton, Pa., for the Lehigh Coal & Navigation Co., 2500 tons; highway bridge at Troy, N. Y., 700 tons, bids closing July 1; Federal Reserve Bank, Minneapolis, Minn., lower structure only, 700 tons; docks and terminals for the Harbor Commission, Wilmington, Del., 1000 to 1200 tons; school at Norfolk, Va., 600 tons. The Lackawanna Bridge Co. was awarded the steel for a paper mill at Millinocket, Me.; the Belmont Iron Works will fabricate three balloon hangers for the War Department, totaling 300 tons; the New England Structural Co. was awarded a school at Manchester, N. H., 400 tons, and the Hay Foundry & Iron Works will fabricate a telephone exchange building in New York, 500 tons.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.48c.; plates, 2.38c. to 2.58c.; structural shapes, 2.58c.; bar iron, 2.28c.

**Ferroalloys.**—The markets for ferromanganese and spiegeleisen are quiet. The only inquiry for the former is one carload lot for early delivery, while for the latter a Middle Western company is asking for bids on 500 tons. Another consumer who last week was considering the purchase of 500 tons limited his buying to 100 tons. There is no activity in manganese ore or any change in values, although an attractive offer might bring lower prices. There has been a decided break in the 50 per cent ferrosilicon market. Sales are reported as low as \$74, delivered, and one interest is willing to book business for early delivery at \$69 to \$70, delivered. Quotations for early delivery are as follows:

Ferromanganese, domestic, delivered, per ton.	\$80.00
Ferromanganese, British, seaboard, per ton.	\$75.00
Spiegeleisen, 20 per cent, furnace, per ton.	\$30.00 to \$32.00
Ferrosilicon, 50 per cent, delivered, per ton.	\$69.00 to \$70.00
Ferrotungsten, per lb. of contained metal.	48c. to 58c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr.	16c. to 16.50c.
Manganese ore, foreign, per unit, seaboard.	22.50c.

**Warehouse Business.**—Little improvement appears in the market. Prices are generally unchanged. There is reported to be some exchanging between warehouses of various sizes of material, where one dealer is short and another is over-supplied. With offers by mills of cold rolled shafting and screw stock at 3c. per lb. base, a slight reduction of warehouse quotations is looked for in some quarters. The situation in iron and steel pipe is unchanged. Brass items are off 1c. per lb. with some dealers, but copper is unchanged. We quote prices on page 1670.

**High-Speed Steel.**—The market continues sluggish with few new inquiries of any size. Producers generally quote 18 per cent tungsten high-speed steel at 90c. to \$1 per lb., nominal.

**Cast Iron Pipe.**—Makers consider themselves fortunate in having so much business at this time when other lines of iron and steel manufacture are depressed. One prominent manufacturer is operating at 75 per cent capacity, which is probably higher than the average. Prices for carload lots, f.o.b. New York, follow: 6-in. and larger, \$53.30; 4-in. and 5-in., \$58.30; 3-in., \$68.30, with \$4 additional for Class A and gas pipe.

**Old Material.**—The principal eastern Pennsylvania steel consumer has reduced its buying price 50c. per ton. The price tendency is slightly downward in several items. There is some movement in price, \$13 being paid by a Lebanon consumer, as well as by a New York broker. There is a pronounced scarcity of stove plate. Some cast scrap has been sold to cast iron pipe makers.

Buying prices per gross ton, New York, follow:

Heavy melting steel	\$6.50 to \$7.00
Rerolling rails	9.50 to 10.00
Relaying rails, nominal	40.00 to 42.50
Steel car axles	10.50 to 11.00
Iron car axles	17.00 to 18.00
No. 1 railroad wrought	10.00 to 10.50
Wrought iron track	7.25 to 7.50
Forge fire	5.00 to 5.50
No. 1 yard wrought, long	8.50 to 9.00
Light iron	2.00 to 3.00
Cast borings (clean)	3.50 to 4.00
Machine-shop turnings	3.00 to 4.00
Mixed borings and turnings	3.00 to 3.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	9.00 to 9.50
Locomotive grate bars	8.50 to 9.00
Malleable cast (railroad)	8.00 to 8.50
Old car wheels	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	\$16.00 to \$17.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	15.00 to 16.00
No. 1 heavy cast, not cupola size	12.00 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	10.00 to 11.00

## Cleveland

CLEVELAND, June 14.

**Iron Ore.**—Although some of the ore men rather expected that ore prices might be named during the week, nothing has been done on the matter. The Ford Motor Co. has sent out an inquiry for 60,000 tons of ore, but there seems to be some uncertainty whether this ore will be purchased. Many of the mining companies will make another wage reduction June 15. This will be approximately a 10 per cent cut and will bring wages back about to those that were placed in effect April 1, 1918. With this reduction the wage scale of independent mines that are making this readjustment will be slightly below that of the Steel Corporation mines. The ore movement shows no improvement. Shipments from Lake Erie docks during May were 1,435,748 gross tons as compared with 2,861,758 tons during the same month last year. Shipments from the docks during the season, up to June 1, were 1,718,119 tons as compared with 4,247,606 tons during the same period a year ago. The balance on Lake Erie docks on June 1 was much larger than on that date in any previous year, being 8,085,839 tons as compared with 6,312,575 tons on June 1 last year. Receipts at Lake Erie ports for the season until June 1 were 1,680,900 tons as compared with 4,037,835 tons during the same period last year. Receipts at other than Lake Erie ports until June 1 were 527,336 tons as compared with 1,792,479 tons for the same period last year. Lake front furnaces at Lake Erie ports received 130,253 tons of ore during May, as compared with 961,097 tons during May, 1920.

We quote delivered lower lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesabi Bessemer, \$7.20; Mesabi non-Bessemer, \$6.55.

**Pig Iron.**—The market was quieter than usual during the past week and prices further declined 50c. a ton on foundry grades. One interest reports sales during the week aggregating 1200 tons in small lots, mostly in foundry iron, at \$22 to \$22.50, but is now quoting the lower price. Some other sellers are still asking \$22.50. An Ohio consumer placed 200 tons with a Cleveland furnace on the basis of \$22.50 Valley for No. 2, but in this case the freight rate from the Valley was slightly lower than from Cleveland and the seller absorbed the differential. For Cleveland delivery prices have been marked down 50c. to \$1 a ton. A 500-ton lot of basic iron recently placed by a Pennsylvania steel plant was taken by a Cleveland broker engaged in other lines, who is now inquiring for iron to cover

this sale. Shipping orders have fallen off and most furnaces report that their June shipments will be less than those in April. This is attributed to the cancellation of castings orders due to the slump in the automobile industry and to the cutting off of some orders by the Ford Motor Co., which is apparently concentrating more of its work at its own foundries.

We quote delivered Cleveland as follows, based on the new freight rate, there being a 56c. switching charge for local iron, a \$1.96 freight rate from Valley points, a \$3.36 rate from Jackson and \$6.67 from Birmingham:

Basic	\$22.96
Northern No. 2 fdy., sil. 1.75 to 2.25	23.50 to 24.50
Southern fdy., sil. 2.25 to 2.75	29.92
Ohio silvery, sil. 8 per cent.	38.86
Standard low phos., Valley furnace	\$39.00 to 40.00

**Finished Iron and Steel.**—The only improvement in the situation is in the demand for structural material in lots of less than 100 tons for building and bridge work. Mill orders continue very light. Consumers in some lines have further curtailed plant operations and little business is expected from manufacturing plants until conditions improve. There is an increasing number of reports of price shading, but prices in this territory appear to be well maintained on steel bars, plates and structural material. However, with lower prices prevailing in the East and in the Chicago territory, buyers feel that a fair-sized inquiry would bring out price concessions. Reports of price irregularities are more numerous in respect to plates, but the only definite report of shading of plate prices by a mill is on 500 tons taken by a Detroit manufacturer. Plate sales have been made in this territory at 1.85c. and 1.90c., but these prices were made on resale material. Some small lot plate orders are being taken for the Pacific Coast. In structural lines the Massillon Bridge & Construction Co. has taken 130 tons for a factory building for the Ladelman Mfg. Co., New Philadelphia, Ohio. Bids have been taken for 230 tons for unloading equipment for the city of New Orleans. Hard steel bars are still quoted at 1.90c., but a round lot inquiry would probably bring out close to a 1.75c. price. Cold-rolled strip steel is weak. Desirable orders are bringing out a 5c. quotation, and even this price is being shaded. Light rails are in fair demand, but some shading from the 2.20c. price is reported and rerolling mills are selling rerolled rails at 2c. or lower. On nails a \$2.90 price is still being quoted by at least one mill and the regular \$3 per keg mill price is being quoted by one jobber for warehouse orders. Warehouse prices on wire have been reduced.

Cleveland warehouses quote steel bars and small shapes at 2.99c.; plates, 3.09c.; structural shapes, 3.09c.; No. 9 galvanized wire, 3.95c.; No. 9 annealed wire, 3.50c.; No. 28 black sheets, 4.80c.; No. 28 galvanized, 5.70c.; No. 10 blue annealed, 3.85c. to 4c.; hoops and bands, 3.69c.; shafting, 4.25c.

**Old Material.**—Prices have further declined and the volume of trade continues very light. Heavy melting steel, cast iron borings and mixed borings and turnings are 50c. a ton lower. Machine shop turnings have declined locally about \$2 a ton owing to the fact that dealers are not buying this grade for stock and the only market for it is in Brackenridge where this scrap is bringing \$7.75. A Youngstown dealer is inquiring for 500 tons of shoveling turnings and 500 tons of compressed steel scrap, offering \$9.25 for the former and \$10 for the latter, delivered Wierton. An Erie, Pa., dealer is inquiring for 1200 tons of various grades for delivery to Pennsylvania mills, offering \$15 for heavy cast scrap, \$8 for machine shop turnings and \$9 to \$9.25 for borings and turnings.

We quote per gross ton delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	\$11.00 to \$11.50
Steel rails under 3 ft.	12.50 to 13.00
Steel rails, rerolling	14.00 to 14.50
Iron rails	12.00 to 12.50
Iron car axles	18.00 to 19.00
Low phosphorus melting scrap	13.50 to 14.00
Cast borings	7.50 to 8.00
Machine shop turnings	4.50 to 4.75
Mixed borings and short turnings	7.50 to 8.00
Compressed steel	8.50 to 9.50
Railroad wrought	11.00 to 12.00
Railroad malleable	12.00 to 13.00
Light bundled sheet stampings	5.00 to 6.00
Steel axle turnings	9.50 to 10.00
No. 1 cast	16.00 to 17.00
No. 1 busheling	7.50 to 8.00
Drop forge flashings, over 10 in.	5.50 to 6.00
Drop forge flashings, under 10 in.	6.00 to 6.50
Railroad grate bars	13.50 to 14.00
Stove plate	13.50 to 14.00
Pipes and flues	7.00 to 8.00

**Coke.**—Several Central Western makers have made a 50c. price reduction on by-product foundry coke, which is now quoted on a \$6.50 Connellsville base.

**Bolts, Nuts and Rivets.**—There is a little more demand from railroads for bolts, nuts and rivets. Bolt and nut prices are unchanged, but a good inquiry would doubtless bring out concessions. Rivets are weaker. Quotations down to 3c. and 3.10c. are being made for structural and boiler rivets respectively for car lots and \$2 a ton higher for smaller lots.

**Sheets.**—Sheets are weak and in light demand. Small lot sales are being made at \$2 a ton under regular prices, and there are unconfirmed reports of larger concessions.

## St. Louis

ST. LOUIS, June 14.

**Pig Iron.**—Aside from the occasional sale of a car lot of pig iron there is absolutely no business developing and practically no inquiry in the market, even of a tentative character. The stove foundries seem likely to get along for some time on their yard stocks, the commercial foundries are operating on 25 per cent or less capacity and generally the business is in a very dull state. The lowest price so far found here for No. 2 Southern is \$22, Birmingham, but there is no business and therefore no competition to develop any definite price. No. 2 Northern is quoted at \$22 to \$23 per ton, Chicago, while the local product across the river is salable at \$24 to \$25 per ton. This gives the local product control of the market with the Chicago iron running second and Southern iron last.

**Old Material.**—There is so little change in the situation in the scrap market as to make it practically impossible to record any new feature. The tone of the market is sagging, but there are no transactions on which to base quotations and in consequence the quotations given can be regarded only as estimated and not as recording any transactions. The softness of the market continues to prevent railroads and industries from offering any material and it is very doubtful if even the most daring of the dealers would make any purchase unless for actual needs on existing contracts. Even deliveries on contracts are being checked wherever there is an excuse for doing so.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Iron rails	\$13.00 to \$13.50
Steel rails, rerolling	12.50 to 13.00
Steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard section, subject to inspection	27.50 to 32.50
Car wheels	12.50 to 13.00
No. 1 railroad heavy melting steel	12.00 to 12.50
Heavy shoveling steel	10.50 to 11.00
Ordinary shoveling steel	10.00 to 10.50
Frogs, switches and guards cut apart	12.00 to 12.50
Ordinary bundled sheet	5.00 to 5.50
Per Net Ton	
Heavy axle and tire turnings	5.00 to 5.50
Iron angle bars	10.50 to 11.00
Steel angle bars	10.25 to 10.75
Iron car axles	20.50 to 21.00
Steel car axles	14.00 to 14.50
Wrought arch bars and transoms	14.00 to 14.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Railroad springs	10.50 to 11.00
Steel couplers and knuckles	10.50 to 11.00
Locomotive tires, 42 in. and over, smooth inside	9.00 to 9.50
No. 1 dealers' forge	7.00 to 7.50
Cast iron borings	6.50 to 7.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
No. 1 railroad cast	12.00 to 12.50
Stove plate and light cast	11.00 to 11.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	10.00 to 10.50
Pipes and flues	7.00 to 7.50
Railroad sheet and tank	5.00 to 5.50
Railroad grate bars	7.00 to 7.50
Machine shop turnings	5.00 to 5.50
Country mixed	7.00 to 7.50
Uncut railroad mixed	8.00 to 8.50
Horseshoes	11.00 to 11.50
Railroad brake shoes	8.00 to 8.50

**Coke.**—Some few small sales of car lots of coke are reported and two or three small contracts for last half delivery, but no business of importance is stirring. Connellsville beehive coke, best selected 72-hr., ranges from \$5 to \$5.75 base, while New River coke is put at \$9 to \$10 per ton. The new Roberts process ovens



entered the domestic coke market the past week, quoting \$8.50 per ton delivered to consumers anywhere in East St. Louis or St. Louis, which is a sharp cut under the by-product coke price of the local gas company.

**Finished Iron and Steel**—No change is noted in the finished iron and steel market, either as to prices or demand. There is no activity at all in the contract division for future delivery, while the warehouse situation shows only very slight improvement which is regarded as only temporary and probably due to some special immediate cause.

For stock out of warehouse we quote as follows: Soft steel bars, 3.22½¢; iron bars, 3.22½¢; structural material, 3.32½¢; tank plate, 3.32½¢; No. 10 blue annealed sheets, 4.22½¢; No. 28 black sheets, cold rolled, one pass, 5.50¢; No. 28 galvanized sheets, black sheet gage, 6.50¢.

## SURVEY OF ACTIVITIES

### Many Idle Plants in the Pittsburgh, Wheeling and Youngstown Districts

The picture of blast furnace and steel works operations in the Pittsburgh, Wheeling and Youngstown districts is not as gloomy as might be expected in view of the very pessimistic reports current about plant activities. A canvass of these districts shows that of the 127 blast furnace, steel works and merchant, 30 now are in blast, while of the 376 open-hearth furnaces, including only those of steel plants producing commercial rolled steel, the investigation disclosed 122 in operation. Operating percentages, therefore, numerically speaking, are about 24 per cent in the case of the blast furnaces and about 32.5 per cent in the case of the open-hearth furnaces. It is of interest to note that of the 30 active blast furnaces in these districts, only one is a merchant furnace, this being No. 2 furnace of the American Manganese Mfg. Co., Dunbar, Pa., which is running on foundry iron. That the showing is as good as it is for these districts may be ascribed to the relatively high rate of operation by the Steel Corporation subsidiaries. The Carnegie Steel Co., for instance, has 17 of its 56 stacks in these districts in blast, a percentage of slightly more than 30, while its open-hearth operations are close to 40 per cent.

### Plant Operations

Conditions in the Connellsville bituminous region remain unchanged. H. C. Frick ovens are all banked. W. J. Rainey, Inc., is working five days a week at its coke plants, but six days a week at 95 per cent at its coal plants.

The Hamilton Bridge Works, Hamilton, Ont., one of the largest concerns in the city, closed its East-end plant June 3. The men were paid off and told to look for other work, and it is not expected that the plant will resume operations again for some time. That other branches of the company might be closed was intimated in an interview with W. B. Champ. The reason given for the closing order was the slump in trade.

Owing to the very small amount of business in hand the shops of the Canadian Car & Foundry Co., Ltd., Montreal, Que., have been in a semi-closed-down condition for some time.

General Manager A. E. Swan states that production is steadily gaining at the plant of the Sharon Pressed Steel Co., Sharon, Pa., manufacturer of automobile parts and frames. Every department is on part time, with average production between 35 and 40 per cent.

The Onida Motor Truck Co., Green Bay, Wis., which has been shut down since shortly after Jan. 1, reopened its plant on a 50 per cent production basis on June 6 to handle an accumulation of new business enabling a schedule of about 50 trucks per week for several months forward.

### Greenfield Tap & Die Corporation Absorbs Two Companies

The Greenfield Tap & Die Corporation, Greenfield, Mass., has purchased the Greenfield Machine Co., Greenfield, and the Morgan Grinder Co., Worcester, Mass., manufacturers of grinding machinery, and will operate them as a machine division at Greenfield before the close of 1921. Temporarily the acquired plants will be operated in their present locations.

By the acquisition of these two companies the Greenfield Tap & Die Corporation secures broad and valuable patent rights relating to grinding on the hydraulic principle, the Morgan company having recently developed a highly efficient internal and the Greenfield concern having for some time manufactured an external grinding machine, both operated on the hydraulic principle.

Until recently the Morgan Grinder Co. operated under the name of Churchill, Morgan, Crittsinger, Inc., and was organized as such April 17, 1919. It occupies two floors or about 8000 sq. ft. at 35 Bartlett Street, Worcester.

Between now and fall, the Greenfield Tap & Die Corporation will erect a large 3-story plant in which its new subsidiaries will be housed. The organization of both plants will remain the same as follows: The Morgan Grinder Co., Ralph L. Morgan, president; L. M. Crittsinger, treasurer; Charles E. Hildreth, general manager. Greenfield Machine Co., E. F. Smith, president; Joseph G. Stevens, treasurer.

### Cost of Health Service in Industry

In a report made by the National Industrial Conference Board, New York, covering 207 plants in 31 industries, it is shown that the average cost of the industrial medical department works out at \$4.43 per person employed. About two-thirds of the number of employees, and likewise two-thirds of the total expense, were covered under the eight classifications of iron and steel, foundry products, automobiles, metal manufacturing, shipbuilding, electrical apparatus, mining, smelting and refining. In these eight groups there were 113 plants covered in the survey, having a total of 508,107 workers and spending \$2,229,237 in a year, or an average of \$4.39 per person.

It is impossible to put in figures the savings effected in these plants by the care given to the health of employees. That it is a means of improving the output, both by increased morale and increased mechanical efficiency of the employees is, however, a matter no longer disputed.

### Jones & Laughlin Steel Co. Acquires More Land

PITTSBURGH, June 14.—The Jones & Laughlin Steel Co., Pittsburgh, has been steadily acquiring property in the vicinity of its Keystone Works on Second Avenue and has just closed another purchase of about eleven and one-half acres from the Consolidated Gas Co. at a price of about \$500,000. This is a very valuable manufacturing site, adjoins its Keystone Works and no doubt will be used some time in the future in building additions to that plant. The company now owns a very large amount of vacant and occupied ground, adjacent to this recent purchase, on which it will be able to make large additions when in its opinion the right time has come.

### Unable to Agree

YOUNGSTOWN, OHIO, June 14.—The conference at Atlantic City between the Amalgamated Association of Iron, Steel and Tin Workers and the Western Sheet and Tin Plate Manufacturers' Association to negotiate a new wage contract for the year from June 30, has adjourned without agreement.

## British Iron and Steel Market

### Iron Makers Waiting for Cheaper Fuel—Steel Mills Dead—Germans Active

(By Cable)

LONDON, ENGLAND, June 13.

It is anticipated that the coal miners' ballot will result in favor of a resumption of work.

Pig iron producers are expecting a heavy demand for foundry iron; in the meanwhile, business is idle. Supplies of Number 3 GMB are unobtainable, but official minimum prices are unchanged. Hematite consumers are buying for delivery after the strike, and makers are less disposed to allow concessions for export; official minimum quotations are unaltered.

The steel position is growing worse. All works are closed and buyers are showing little interest owing to prevailing high prices. Makers are awaiting cheaper fuel before announcing any reductions.

Germany is securing fair tonnages of finished and semi-finished material. German billets are being sold at £6 (\$22.44). Ship plates are offered at £9 10s. (\$35.53), light rails are quoted at £9 5s. (\$34.59), all f. o. b.

There is a fair continued demand for tin plate. Sellers from stock are asking 27s. (\$5.05) basis f. o. b. A few small orders or ordinary sizes have been placed with Holland and Scandinavia. Oil wasters are very scarce.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.74 per £1 as follows:

Durham coke .....	£2 2	\$7.85
Cleveland basic .....	6 0	22.44
Cleveland No. 1 foundry .....	6 5	23.37
Cleveland No. 3 foundry .....	6 0	22.44
Cleveland No. 4 foundry .....	5 19	22.25
Cleveland No. 4 forge .....	5 17½	21.97
East Coast mixed .....	8 0 & £7 10*	29.92 & \$28.05
Ferromanganese .....	18 0 & 16 0*	67.32 & 59.84
Ship plates .....	16 0 to 19 0	59.84 to 71.06
Boiler plates .....	24 0 to 25 0	89.76 to 93.50
Tees .....	15 10 to 18 10	57.97 to 69.19
Channels .....	14 15 to 17 15	55.16 to 66.39
Beams .....	14 10 to 17 10	54.23 to 65.45
Round bars, ¾ to 3 in. ....	15 0 to 16 10	56.10 to 61.71
Rails, 60 lb. and up. ....	13 0 to 15 0	48.62 to 56.10
Billets .....	11 0 to 11 10	41.14 to 43.01
Sheet and tin plate bars, Welsh .....	11 0 to 11 10	41.14 to 43.01
Galvanized sheets, 24 g. ....	22 0 to 22 10	82.28 to 84.15
Black sheets .....	19 0 to 20 0	71.06 to 74.80
Tin plate base box .....	1 5 to 1 9	4.67 to 5.42
Steel hoops .....	17 10 to 20 0	65.45 to 74.80

\*Export price.

### Industrial Paralysis Continues—Stock Being Rapidly Depleted—Use of Fuel Oil

LONDON, ENGLAND, May 10.—Business, so far as iron and steel are concerned, is in a state of suspense.

The coal strike continues and the industrial paralysis caused by it is extending seriously. The reserves of coal stocks both for industrial and domestic purposes are becoming perilously small and in some quarters even gas for household use is being rationed. Workers in all trades are naturally suffering acutely and the number of bread-winners unemployed is estimated at no less than 5,000,000, while nearly 15,000,000 are feeling the pinch of poverty, the loss in working days in the month of April totalling 24,000,000.

One of the results of the scarcity of fuel is to give considerable stimulus to the use of oil fuel. At Hull, for example, all boilers of the Corporation Tramways power station have been converted for the use of oil, so that the electricity for running cars is now entirely generated by means of oil fuel, the coal that would otherwise have been used having been handed over to the municipal bakeries.

Meanwhile business in the iron and steel markets is negligible. Nearly all British quotations are subject to delivery three or four weeks from the resumption of work. A feature of the situation is, however, the disappearance of considerable quantities of stock material that had been hanging over the market. In cer-

tain directions works have been able to hold on pretty well where gas, electric or water power can be used, but most of the large mills are now silent.

A report on the bolts and nuts, cut nails and horse-nail trades by a sub-committee, appointed by the standing committee on trusts, has been issued. Manufacturers of bolts and nuts are found to be not associated in any organization which embraces all the trade and the two associations operating in the Midlands, Lancashire and Yorkshire, do not appear to be exercising any substantial control over either prices or supplies, and the increase in price which had recently taken place cannot be directly attributed to them. The Cut Nails Association, responsible for 99 per cent of the country's output, fixes minimum prices and controls output. The control of prices, says the report, effectively prevents competition and, in the absence of imports, the consumer is compelled to pay the prices fixed. The sub-committee recommends that Parliament should authorize the board of trade to exercise surveillance over the existence, development, and activities of trade combinations in this country.

## GERMAN PRICES STEADIER

### Warehouse Tendency to Cut—Sheet Market Still Soft—New Schedule for Iron Association

(Special Correspondence)

BERLIN, GERMANY, May 28.—Developments during the past week tend to create the impression that prices are beginning to stabilize somewhat, though it would be rash to infer that the downward tendency has come to an end. There is some inclination to account for the slight improvement in the tone of the market by the difficult position of the Upper Silesian iron industry as well as the labor unrest in Great Britain. Price cutting by jobbers was a feature of the bar iron market, quotations by the works ranging between 1750 to 1800 m. per ton (\$24.67 to \$25.38) while jobbers named 1700 m. (\$23.97), but were unable to supply any but moderate quantities. For finished material we quote as follows:

	Marks per Metric Ton	
Beams .....	1750	\$24.67
Rounds .....	1750 to 1800	\$24.67 to 25.38
Flats .....	1400 to 1450	19.74 to 20.45
Bolt and nut iron .....	2000	28.20
Structural shapes .....	1700 to 1750	23.97 to 24.67
Hoops, iron .....	2150	30.32
Hoops, steel (hardened) .....	8000 to 8300	112.80 to 117.03
Wire .....	1600 to 1650	22.56 to 23.27
Rails, best steel .....	2520	35.53
Rails, ordinary heavy .....	2300	32.43
Double angle splice bars .....	2700 to 2750	38.07 to 38.78

The sheet and plate market is in a demoralized condition. Overproduction and pressure of supplies were responsible for a further slump in prices, especially as far as the thin plate market is concerned. We quote as follows, per ton:

	Marks per Ton	
Sheets, No. 6 U. S. S. gage and up .....	1800	\$25.38
Sheets, No. 11 U. S. S. gage .....	1900 to 1950	\$26.79 to 27.50
Sheets, No. 11 U. S. S. gage, basic Bessemer .....	1800 to 1850	25.38 to 26.09
Light plates, according to gage and quality .....	2000 to 2100	28.20 to 29.61

At the last sitting of the Association of German Iron Merchants at Duesseldorf, the following price schedule was drawn up:

	Marks per 100 Kg.	
Bar iron .....	250	\$3.53
Hoop iron .....	275	3.88
Heavy sheets, according to gage .....	260 to 271*	\$3.67 to 3.82
Medium sheets .....	280	3.95
Light plates, according to gage .....	304 to 333	4.28 to 4.70

The above prices do not represent a final settlement but are merely to serve as a guide in closing deals, the penalty for firms disregarding these prices amounting to 10,000 m. It is hoped that this action will eventually be instrumental in stabilizing conditions in the iron trade.

At the recent sitting of the Association of German Rivet Manufacturers at Duesseldorf, base prices for boiler, structural and ship rivets were reduced by 400 m. per ton.



## FOREIGN CRANE TENDERS

### Objections to Free Admission of International Bidding for Municipal Pier Equipment

Considerable agitation has been occasioned among American crane builders by the possibility that tenders to be issued shortly for the 34 3-ton gantry cranes for the Pan American Terminal & Dock Co. piers at Stapleton, Staten Island, New York, will be entertained from foreign as well as American builders. These cranes are being purchased by the City of New York, which is building 12 piers at Stapleton in fulfillment of its agreement with the lessee of these docks. The specifications will shortly be submitted to the Board of Estimate and Apportionment of New York, and, if approved, appropriation will be made by the Sinking Fund Commission, and the Commissioner of Docks, Murray Hulbert, will be authorized to issue a call for bids.

These termini, it is believed, will come under special observation as something advanced in terminal equipment and American crane builders emphasize that the effort should be made to place American built cranes on these docks. This is not regarded as certain if foreign bidders are permitted to enter quotations, as with the present exchange rates and low production costs, so far as Germany is concerned, the contract would of necessity be awarded to a German builder.

When these docks were first projected, the Material Handling Machinery Manufacturers' Association, New York, which is not now in existence, urged that instead of all twelve piers being of one type, two should be equipped to satisfy a possible lessee, the Pan American Terminal & Dock Co. It was also pointed out that Stapleton did not offer best possible rail connections. As the City of New York leases its docks on a basis of 7 per cent of the total investment, the first cost to the city is a secondary consideration.

The Pan American Terminal & Dock Co., after investigation in Europe, prepared specifications. A committee of the Material Handling Machinery Manufacturers' Association suggested, according to its chairman, W. B. Clark, of Manning, Maxwell & Moore, New York, the addition of alternate specifications, among other minor changes permitting the builder to quote on the pillar or column type of crane, which is the American type as well as the king pin and roller type, called for by the Pan American company. Neither approval nor disapproval of the admission of foreign bidders was possible, according to Mr. Clark, as the committee was dealing only with a possible lessee of the docks and not with the ultimate buyer of the cranes.

Commissioner of Docks Murray Hulbert claims "the duly appointed committee of the association passed on the plans and other essentials as they now stand and he can see no good reason for erecting a wall of any kind against foreign bidders, particularly in this case."

E. Logan Hill, Heyl & Patterson, a member of the original committee appointed to pass upon the specifications prepared by the Pan American Terminal & Dock Co., referred to the practice of American crane builders to carry about 2 per cent of the total value in spare parts, which incidentally would be obtainable in a few days.

J. A. Shepard, Shepard Electric Crane & Hoist Co., New York, has written to Commissioner Hulbert enumerating his objections. His letter read in part:

The measure of success which may be expected from the operation of the mechanical equipment which the city of New York is to install upon some of the Staten Island piers is a matter of importance to the city primarily, but secondarily it is also of interest to the entire country, because it marks the beginning of a movement which must be followed sooner or later by every port authority upon the American continent.

Machinery of the character in question has not attained a degree of standardization which permits of its quality being completely regulated by specification. As a consequence the best results will be obtainable only where the interests of the contractor are identical with those of the

city as would be the case, if the contract is awarded to an American manufacturer. Foreign manufacturers of cargo handling machinery can reasonably be credited with no motives other than a desire to realize immediate profits. It is inconceivable that conditions will be permitted to continue through a series of years, which would give them control, as at present, of the American market, hence there remains to them no incentive for constructive handling of American contracts. We must of necessity depend upon the American manufacturer to do that.

At present the specifications on the Stapleton cranes stand as approved by the committee originally appointed by the Material Handling Machinery Manufacturers' Association. Unless special action is taken by the Board of Estimate and Apportionment, foreign bidders will probably be admitted to the number of 13 or more, of which three will doubtless be German companies, four British and the others, Danish, French Belgian and Dutch.

### Drop Forgers to Meet at Chicago

The American Drop Forge Association and the Drop Forge Supply Association will hold their annual convention jointly at Chicago, June 22, 23 and 24, at the Hotel Drake. President Ferdinand Bernickol, Indianapolis Forging Co., Indianapolis, will give the opening address on the morning of June 22 and reports from Secretary E. B. Horne and Treasurer T. W. Siemon are scheduled.

The following papers will be given in the afternoon of that day: "Twenty-five Years of Forging Experience," by C. E. Adama, Cleveland Hardware Co., Cleveland; "Some Experiences in Industrial Co-operation," by Arthur H. Young, International Harvester Co., Chicago; "Board Versus Steam Hammers," by R. T. Herdegen, Dominion Forge & Stamping Co., Walkerville, Ont. The evening will be occupied with a banquet.

On Thursday morning the following papers will be delivered: "The Future of the Tractor Business," by James M. Irvine, Curtis Publishing Co., Philadelphia; "The Necessity for Proper Cost Accounting," by J. B. Sehl, Billings & Spencer Co., Hartford, Conn.; "Previous Changes in Price Levels and Probable Results of This One," by Colonel Leonard Ayres, Cleveland Trust Co., Cleveland.

That afternoon will be devoted to visits to plants in the Chicago district. Among the visits suggested are: Ajax Forge Co., Interstate Iron & Steel Co., A. Finkl & Sons Co., Crane Co., all of Chicago; Studebaker Co., South Bend, Ind. A banquet tendered by the Drop Forge Supply Association will be held that evening.

On the morning of Friday the following papers will be delivered: "Manufacture of Steel," with pictures, by John Bruner, Illinois Steel Co., Chicago; "Electric Furnaces, Heat Treatment of Dies and Forgings," by E. F. Collins, General Electric Co., Schenectady, N. Y.; "Furnace Condition for the Proper Heat Treatment of Die Blocks," by Dr. Samuel Trood, Tate Jones Co., Inc., Pittsburgh.

### Contract for Seamless Boiler Tubes

WASHINGTON, June 14.—It is understood that the Emergency Fleet Corporation has decided to award the contract to the Standard Seamless Tube Co. for 140 tons of seamless boiler tubes on which bids were opened yesterday. Sizes and prices per foot bid by the Standard Seamless company were: 4-in. No. 9 tubes, 39.84c.; 3-in. No. 10, 26.82c. and 3.5-in. No. 9, 34.62c. Prices are f.o.b. Ambridge, Pa, with freight equalized at Pittsburgh, tubes to be subject to both Steamboat Inspection service and American Bureau of Shipping inspection, and bought as stock for distribution from warehouses for Fleet Corporation vessels.

### Motor Truck Prices Reduced

The International Harvester Co. has reduced prices on its entire line of motor trucks, reductions ranging from \$900 on 5-ton truck to \$100 on 1-ton truck.

## ORDERS VERY LIGHT

### Youngstown Manufacturers Are, However, Hoping for Improvement in the Fall

YOUNGSTOWN, OHIO, June 14.—Incoming business of the leading independent steel producers in this territory averages from 15 to 18 per cent, thereby touching the lowest level in many years. Orders include a variety of finished commodities, the past ten days witnessing a revival in the sluggish activity in pipe and plates. Sheet buyers are still largely holding off, with a large proportion of current tonnage going to the automobile industry. Small sales of galvanized have recently been made to Southern consumers.

The chief cause of the current strangulation of industry is traced by steel leaders to freight rates, which are characterized as "excessively high" on raw materials entering into iron and steel manufacture and on the finished products.

At the present time independent interests in this territory are concentrating their attention on efforts to reduce costs in every line of activity, evidently believing that a lower price level is immediately ahead of the industry. Pointing to the importance of the export trade to the American steel industry, J. B. Kennedy, chairman of the board of directors of the Brier Hill Steel Co., states that German and Belgian competitors are underselling American makers, despite the fact that most, if not all, producers in this country are now selling at a loss. He declares that lower steel-making costs are therefore not only highly desirable but are imperative, if American producers are to compete with foreign makers without dissipating their properties and if they are to be in a position later on to effectively handle business.

There are indications, a number of steel men say, that business, involving a large tonnage in the aggregate, is being withheld for the time being until costs and prices reach a more stabilized level. When these interests are satisfied that prices have been fully liquidated for the time being, it is expected heavy tonnages will be released that will have a very favorable effect on the industry. Such an improvement is not looked for, however, until September and possibly later. In the meantime it is regarded as almost essential to the prosperity of the industry that carrying charges be equitably readjusted. In spite of current inactivity, makers believe it is yet possible to experience a revival in buying in the fall that would carry production to 50 or 60 per cent by the end of the year.

#### Some Concessions in Pipe

Diversified pipe buying features the market, though even it is on a relatively small basis. Though keen competition is being waged for the larger sizes of pipe, standard stabilized prices are generally being maintained. It is known that concessions have been made, however, on certain sizes now figuring largely in going business.

A sheet maker states that prices of black sheets are being shaded as much as \$5 a ton. Light gages of galvanized sheets have recently been sold to jobbing interests at substantial concessions from the 5c. base. In order to get business, concessions are being made likewise on full finished stock, district producers maintaining a small volume of unfilled tonnage.

A regular though diminished volume of sheet bar movement to non-integrated makers indicates that they are getting their share of the going sheet tonnage with the self-contained interests. The highly modernized mills of such producers, enabling efficient production, offsets the disadvantage of such companies in periods of keen competition of not having their own iron and steel making equipment. Buyers are insisting that a more attractive price than \$39 be offered on open-hearth sheet bars. It is the practice in the semi-finished trade to allow tonnage to accumulate sufficient for a week's rolling, and then to work off the orders. Virtually all of the skelp now being rolled by district interests is consumed in their pipe mills.

All independent wire makers in this territory continue to quote the \$5 per ton reduction, bringing wire

to \$2.75 and nails to \$3. It is the impression that these prices are weak.

#### Little Activity in Pig Iron

Pig iron reflects the sluggishness in the general steel market, the price on basic ranging from \$21 to \$22, while Bessemer commands \$23.

Expected upturn in tinplate buying has so far failed to materialize, insofar as the principal Valley producer is concerned, and his mills are wholly suspended. The few orders that are straggling in are filled from stock. This maker states there is apparently a well-balanced demand which is held up for the time being.

Very light plate inquiries are being received and the price is variable in view of the absence of demand. On small current business, the stabilized quotation rules, though no tonnage in volume has appeared recently to test the market.

In raw materials, heavy melting scrap is nominal at \$13 and hydraulically compressed at \$10. The Steel Corporation is reported to have been taking on some small lots of heavy material at these prices for some time past. Some dealers have purchased railroad scrap within the past two weeks to fortify themselves against anticipated needs later on.

Selling at 4.50c., prime Western spelter is lower than at any time in the past 12 years, declining from 4.65c.

In the spot market, three-quarter<sup>in</sup> gas coal is moving around \$2.75 with the price down to \$2 for slack. Beehive furnace coke is nominal at \$3.25 spot. Demand for coal and coke is so limited that prices in some instances are actually determined by the necessities of the seller.

### Americans at International Chamber of Commerce Meeting at London

More than 200 leading American business men sailed recently to attend the first annual meeting of the International Chamber of Commerce in London the week of June 27. The delegates included bankers of international reputation, manufacturers, economists, publicists, merchant marine experts and leading distributors. The restoration of the world's commerce will be the leading theme. Eleven countries will be represented. The convention will be organized into five groups, one group being devoted to one of the following subjects: Transportation, communication, finance, production, distribution and devastated regions.

Among the delegates are: A. C. Bedford, Standard Oil Co.; Ivy L. Lee, publicist, and Dr. Van H. Manning, former director of the Bureau of Mines, all of New York; Edward N. Hurley, Chicago; Charles T. Main, consulting engineer, Boston; E. J. Lavino, alloys, and Stanley G. Flagg, of the company of his name, both of Philadelphia; Edward D. Frohman, Obermayer Co., and W. S. Bartholomew, vice-president Westinghouse Air Brake Co., both of Pittsburgh; Clarence H. Howard, president Commonwealth Steel Co., St. Louis.

### Brier Hill Steel Co. Passes Common Dividend

YOUNGSTOWN, Ohio, June 14.—After paying dividends continuously since April, 1916, on its common stock, the Brier Hill Steel Co. has omitted the second quarter common payment, due July 1. The regular preferred dividend of \$1.75 per share was authorized June 13 by directors, payable July 1 to stock of record June 20.

It was announced that omission of the dividend was due to reduced earnings on account of the business stagnation and to conserve cash. The cash position of the company is declared to be satisfactory.

Excavations have been made for a building to house a set of flying shears to be installed in connection with its No. 23-in. mill at Youngstown, Ohio, by the Carnegie Steel Co. The new shears will be operated by electric power and will replace shears operated by hydraulic pressure. The installation will save considerable time in cutting the output of the mill to the desired lengths.



## GERMAN MACHINE SALES

### Rolling Stock Orders from Near East—9-hr. Day Advocated—American Machinery Excluded

(Special Correspondence)

BERLIN, GERMANY, May 27.—Coincident with the relaxation in the political tension by the signing of the ultimatum of the Allies, a slight improvement in the general economic situation is noticeable which, in a measure, is reflected in the machine industry. Some branches are already reporting a revival both in inquiries and orders placed, and in general the impression prevails that the worst is over.

Shipbuilding, typewriter, bicycle, and rolling stock industries have been particularly active of late. Shipbuilding plants are well stocked with orders, both for domestic and foreign account, some plants even reporting a shortage of skilled labor. It will be recalled that the Reichstag voted 11,970,000,000 m. for the reconstruction of German shipping, of which 7,270,000,000 m. have already been paid in advance. The total amount thus placed at the disposal of German shipping will not allow the building of any but a minimum percentage of the pre-war tonnage.

One stipulation of the Reconstruction Bill provides that at least 90 per cent of the new tonnage is to be built in German yards. It is interesting to note that about 85 per cent of the new ships are to be equipped with ordinary marine engines of the reciprocating type, while the prime movers of the remaining 15 per cent will chiefly be turbines, only a small number of ships being fitted with Diesel engines.

#### Rolling Stock Builders Active

Trade with the Entente countries has been on a small scale during the past months, but a satisfactory volume of business is being done with Holland, mostly transit shipments to overseas countries, Denmark and Sweden. In the locomotive and rolling stock industry, all plants have substantial orders on their books, both for domestic and foreign account, and are probably well filled for more than a year ahead.

Apart from the orders placed by the Soviet Government, the Balkan countries are in the market for engines and rolling stock. A prominent Duesseldorf works, the Rheinische Metallwaren und Maschinenfabrik Aktien Gesellschaft, is busy on several foreign contracts, including an order from the Rumanian Government for heavy freight locomotives. Several commercial missions from the eastern states have recently arrived in Germany to investigate the German market for the delivery of various engineering products. Fairly large orders have been placed by a Bulgarian and Turkish commission for automobiles, locomotives, railroad material of all kinds, mining equipment, hardware, elevators, measuring instruments, electrical fittings and accessories. About 70 locomotives were ordered by a Serbian commission, and a special railroad commission from Bulgaria is expected to arrive in Germany soon. Another commission, from Jugoslavia, has arranged for the repair of rolling stock and has also ordered rails and track supplies. Italy placed an order for 284 locomotives prior to the ultimatum, but the contract is said to have been canceled owing to the export tax problem. A resumption of negotiations seems probable, however. China and Spain have lately been in the market for munitions, especially semi-finished stock, as well as infantry munitions, but labor is frequently inclined to cause troubles on political grounds.

#### Agricultural and Textile Machinery in Demand

The agricultural machinery line has apparently overcome the stagnant period of the past months; farmers are coming forward with orders and there are indications of export revival. The Soviet Commission now in Germany is negotiating the purchase of agricultural machinery and implements, dairy machinery and equipment, peat-cutting machinery, etc. Hand tools are not in great demand.

Great hope is entertained that the recent customs revision of the Russian border states will prove a stimulus to export business. The new tariff in Esthonia

reduced the duty on agricultural machinery, tractors, automobiles and accessories from 60 to 20 rubles per pud (36.07 lb.). Lettland has entirely abolished all duties on agricultural and dairy machinery and Lithuania has abolished duties on agricultural machinery, implements and accessories, while for dairy machinery a 5 per cent ad valorem duty is charged.

The textile machinery line, according to statements by Chemnitz makers, also shows improvement, particularly in weaving and spinning machinery, with India still the most important foreign customer.

The slow recovery of the machine tool industry holds true for the automobile industry. The best customers are the Scandinavian countries, Holland and South America. The Wanderer Works at Chemnitz is engaged on motor cars and motorcycles ordered by the Japanese Government, the cars leaving Germany ready for field service. The same company has also taken up the manufacture of adding machines, which will be marketed at about 15,000 m.

The Benz Motor Car Co., Mannheim, plans to close down part of its works June 1, owing to a curtailment of production incident to the stipulations of the Allies regarding the construction of Diesel engines. The company states that a considerable volume of export orders has been lost in this way, rendering the shutdown of some sections necessary, though the automobile plants have not been affected by this action.

Demand for large machines forms a feature of the electrical industry. A firm in Saxony, specializing in motors and transformers, gives the value of orders on its books at 140,000,000 m.

#### Improved Labor Situation

The labor situation may be epitomized by the words of the director of a large turbine works: "Fewer strikes, the return of the will to work, steadily diminishing opposition to piece work or bonus systems of payment, a less radical stand on socialization and a gradual return to pre-war efficiency." It is difficult to predict the future trend. The enormous financial burden Germany has taken upon her shoulders by signing the ultimatum will have to be borne by all classes.

Advocates of reintroduction of the 9-hr. day in the principal industries are steadily increasing, and it is rumored that the Government has been sounding the attitude of labor. Judging by the statements made by responsible officials of the German Metal Workers' Union, labor is showing the greatest hostility toward all projects of this kind. The trend of wages is shown in the following table, the figures given referring to the largest towns:

Wages in the Engineering Industry—In Marks per Hr.

	May, 1921		July, 1914	
	Day Work	Bonus or Piece Work	Day Work	Bonus or Piece Work
Fitters, turners, mechanics, etc. . . . .	5.80-6.00	7.50-8.50	0.70-0.75	0.80-0.90
Machine hands, semi-skilled labor . . . . .	6.00-6.10	6.40-6.50	0.50-0.55	0.60-0.65
Unskilled labor . . . . .	5.00-5.20	.....	0.35-0.45	.....

#### Imports of American Machinery Prevented

The policy of the Government toward the import of foreign machinery and tools has not changed in a material way. Imports are still barred unless the goods in question cannot be economically produced domestically. Recently the Federal Economic Council, Germany's national industrial parliament, refused the import permit, applied for by a Hamburg importer, for 50,000 razor blades of the Gillette type, and an application by another firm for the import of 4000 to 6000 typewriters made by the Noiseless Typewriter Co., which were to be marketed in Germany at about 9000 m.

In the former case, it was ruled that the Solingen cutlery industry was in a position to produce the same quality blades and the present difficult position of that industry was considered as another reason for the embargo. In the latter case the high price of the American machine (compared with that of German makes) was held to be a further strain on the German industry, quite aside from the fact that the German industry, quite aside from the fact that the German industry, it was stated, is now turning out machines equal in every respect to American makes. The case of the Ford tractor is still under consideration.

# Bankers Object to Protective Tariff

Congressman Tilson Charges That They Stand in Way of Enactment of Proposed Law—Differences of Opinion as to Ad Interim Legislation

WASHINGTON, June 14.—Delay of action on protective tariff legislation by Congress has been charged to several reasons, and of late opinion has been developing that one of the chief causes is a growing antagonism of certain banking interests of the country. The claim, whether made justly or unjustly, has found frequent informal expression among members of Congress, but yesterday was set forth rather sharply in an authorized statement issued by Representative John Q. Tilson, chairman of the subcommittee in charge of the metal schedule of the tariff.

In his statement Mr. Tilson deplored what he characterized as the efforts being made by "certain banking interests in this country to prevent the adoption of customs duties which will adequately protect American industries and American labor."

He pointed out that heretofore the American banker has been as much an advocate of a protective tariff as American manufacturers, but that there has been a realignment of interests which has put the big banker on the side of the importer and apparently out of sympathy with efforts to prevent the "flooding of our markets with foreign-made goods." The success of a combination of international bankers and persons interested in foreign trade, it was declared, in their efforts to delay or prevent the imposition of customs duties which will be adequately protective, would be disastrous to the country.

## Household Neglected

"We all know of the good lady who was so much interested in the affairs of all the other people in the neighborhood that she neglected those of her own household," said Representative Tilson. "I fear that we are in danger of doing that very thing in this country. The world has been in such a turmoil for so long a time and we have become so absorbed in world problems that it seems altogether too circumscribed and narrow for us to turn our thoughts and attention to domestic concerns. And yet there is great need for us to do that very thing, even though it may seem for a time dull, prosaic and commonplace."

"We hear so much of international trade, debts and exchange that many forget the fact that there is, or ought to be, a considerable amount of strictly American business. We have been so accustomed to seeing exporters and importers and international bankers reap rich harvests as a result of the great upheaval that it is quite natural to overlook the relatively unimportant domestic affairs."

## Period of Real Danger

"Strictly American industries are passing through a period not only of depressions, but of real danger. The alignment of interests have shifted. Heretofore the banker and the manufacturer had a common interest and together they upheld the structure of American business for the benefit of both labor and capital. With the great increase in international debts has come an increase of opportunity for profitable banking relations and this opportunity will not be neglected. This will mean that the purely American industries will lose the help of a very powerful friend, while international commerce and the larger and more powerful industries which are able to compete in foreign markets will gain. Herein lies the danger, for it is not the prosperity of the few larger corporations but that of the many individuals and small organizations, engaged in agriculture as well as manufacturing and their employees that should be our chief concern, because these are the most important as well as the most numerous. If we neglect our own industries, there can be no real or gen-

eral prosperity to the farmer, the mechanic or the manufacturer and in the end the entire public will suffer. If, in order to stimulate international trade we permit an increasing amount of foreign-made goods to enter our markets, an increasing number of our workingmen will be walking the streets of our industrial cities and towns looking for work, while the agricultural producer will look in vain for some one to buy his produce. If the banking interests now desert domestic for foreign business and are successful in preventing the protection of our American industries, they will doubtless reap greater profits for the present, but in my judgment will eventually lose by the operation."

## Other Obstacles

The Tilson statement promises to add to the numerous conflicts of opinions regarding the deferred program of enacting tariff legislation. Differences of various kinds prevail, and are not sectional, as is generally the case, but involve changes in American industrial history that have developed during the past few years, as well as the engagement of international problems that have grown out of the war, the shift of this country from a debtor to a creditor nation.

While Chairman Fordney had hoped to introduce the bill the latter part of the current week, it still is uncertain how long it may remain in committee. All of the schedules have been passed upon, but not one, it is stated, has been definitely closed and efforts are being made by various sources to bring about changes in rates, in some schedules, especially with regard to those relating to wool, lumber, silk and chemicals.

Further complicating the situation is the sharp division over ad interim legislation. The Longworth resolution which would make rates in the permanent tariff bill effective from the day the latter is reported to the House was defeated at a Republican caucus of the House recently. Since then the steering committees of the Senate and House have appealed to the United States Tariff Commission, it is understood, to draft a measure providing for ad interim legislation which it is hoped will placate much of the opposition to the Longworth resolution. One of the principal protests against the latter was that it gave the Committee on Ways and Means complete power to put into effect any or all of the rates in the permanent tariff bill without first letting members of either the House or the Senate know what the rates are. It is stated that this objection will be removed and Congress be allowed to know the character of the rates to be made effective immediately, and their amounts. If this is done, it is believed that considerable progress will be made, though there appear to be several knotty problems yet to be solved before the tariff bill gets before the House. Some members of the Ways and Means Committee think they can be worked out comparatively early, while others favor the idea of presenting the bill practically in its present shape and carrying the fights on it to the floors of Congress.

Imports into the United States in 11 months ending May 31 amounted to \$3,471,876,288, and exports to \$6,179,603,978, according to preliminary figures issued by the Department of Commerce. The imports are below those for the corresponding period of last year to the extent of \$1,213,870,292, or 25.9 per cent. Exports lacked \$1,300,007,928, or 17.4 per cent, of last year's total. The excess of exports for 11 months was \$2,707,727,690, which is only 3 per cent below last year's figures of \$2,793,865,326.



## Iron and Steel Jobbers' New Problems

(Continued from page 1620)

on the whole to standardize with your own American material. But with us the case is rather different. Our natural resources cannot, as yet, produce all the qualities that it is necessary for this market to have. Several lines have still to be imported, making it essential for the iron and steel warehouses to carry, in some instances, duplicate, triplicate and even quadruplicate stocks of different qualities in certain sizes, in order to serve the trade properly.

"We have of necessity been brought into touch with many interesting peoples of other lands and with many interesting things. We were made familiar in a previous day with the wonderful resources of the territory of occupation which the Allied Armies now hold. We were brought in touch with Belgium, with the iron works of Sweden and with the steel mills of Lorraine. The old Canadian merchant houses still exhibit invoices of a century ago for their early purchases of bar iron from Great Britain—a connection which Great Britain still holds, though to a less degree than formerly. And so the Canadian warehouse is in a position to-day, as before, to offer the cream of material from many different lands.

"Canada continues to advance in its manufacture of iron and steel. Our Canadian mills produce excellent material which we continue to buy and stock in increasing quantity. Our latest additions, in the plate mills at Hamilton and at Sydney, are now in operation and turning out an excellent quality and finish of open-hearth plate. We naturally buy at home what material we can, if of equal quality and at equivalent import prices. At the same time a considerable quantity of our steel supplies will continue to be imported from the United States, and it is only proper to say that no makers have treated the steel merchants of this country more fairly or more generously than the steel manufacturers of your country.

"We have learned much from the steel warehouse people in the States. They have never hesitated to pass on to us information that would assist us in our problems here. Our methods are based on their methods, and we take this opportunity of expressing our appreciation.

"The steel merchant in Canada, as in the States, is no mere cumber of the earth. He has a useful and an important part to play in the business world, and just in proportion to the extent that we carry stocks sufficiently large and varied to satisfy the general requirements of the trade, will our efforts be respected by the mills and appreciated by the consuming public."

### The Business Outlook

One entire session of the convention was given up to a discussion of conditions and prospects in the iron and steel industry.

Severn P. Ker, president Sharon Steel Hoop Co., Sharon, Pa., in speaking to the topic "A Look Ahead by an Optimist," gave his hearers grounds for hopefulness in a well-reasoned survey of the record of the American steel industry. From the statistics of production he showed how after any recession from prosperity a new high record had been reached, as demand swept on under new stimulus. In this connection he referred to the prophecy of Charles M. Schwab in the late eighteen-nineties, that in the next 20 years the United States would reach an output of 30,000,000 tons of steel ingots, and to the incredulity with which the prediction was received. [The 30,000,000-ton mark was actually passed in 1912.] Mr. Ker said he was willing now to make the prediction that the steel ingot production of the country would get up to 60,000,000 tons by 1930. To-day more than half the world's steel is produced in the United States and this leadership is to continue.

Concerning the present situation, Mr. Ker was free to say that part of it was due to the extravagance that had been so well recognized in our life, both among the workers and those who directed industry, and the latter had set the example. The lesson of economy

must be learned again, and is being learned. Radicalism is losing its hold among the workers, who are beginning to realize the need of increasing production, as well as the necessity of lower wage rates. The speaker believed, so far as iron and steel are concerned, further reduction in labor costs will be necessary before the country can start on the next forward movement. He looked for some betterment before the end of the year, for the industry was now at such a low point that the next change must be for the better. He believed it was right now really dragging on the bottom, so far as output is concerned, and that before long it would be seen that the country was "mushing back" to prosperity.

### No Short Cut to Prosperity

A. I. Findley, editor THE IRON AGE, was assigned a double subject—"A View of the Steel Market and Some Thoughts on the Problem of the Pittsburgh Base." In the concluding portion of his review of the present market situation, he said:

To say that buyers of steel look for some further decline in prices; that steel producers look for a reduction in freight rates and that some of them believe wages will be still lower before a basis will be reached that will warrant free buying—to say these things is equivalent to saying that time will be a large element in the readjustment that remains. That makes prophecy difficult, though the obvious prognosis is that whatever revival in demand comes this year it will not develop into large proportions. The state of mind of many workers, of many manufacturers and merchants needed to be changed. The worker had begun to visualize war wages as his legitimate and normal wage. Many manufacturers and merchants had begun to visualize war prices as legitimate and their continuance as justified. Inflation had been pictured by some economists as an expected and long-enduring result of the war. Many had predicted that a depression would follow the war and when instead we had the boom of 1919 and 1920, the feeling came that the depression would be staved off one year, two years or even longer. Time must be the corrective of the state of mind which swept so many business men off their feet. There will be no short cut to prosperity. Industry must get back to the old-fashioned economies and it is getting back to them. That is the main encouragement in the situation. And the fact that a good deal of progress can yet be made in 1921 along the old road of working and saving and of willingness to do a full day's work, is at the moment one of the most hopeful features in the outlook for iron and steel and for all industry.

The second part of the paper was devoted to a résumé of the controversy over Pittsburgh price basing and the various steps in the case before the Federal Trade Commission. It was predicted that a final adjudication would be a matter of two years or more, seeing that, in case the complaint now pending at Washington is sustained, the issue would be taken to the courts.

### The Nut and Bolt Trade

W. F. McKenzie, Buffalo Bolt Co., Buffalo, speaking for the trade in nuts and bolts, referred to the shipment one year ago of 250,000,000 bolts per month whereas in April, 1921, shipments were 90,000,000 bolts. The manufacturers, he said, had gone far in the readjustment of their prices to present conditions. The five leading sources of demand were the agricultural implement trade, automobile manufacturers, the railroads, the jobbing trade and the foreign buyer. According to the speaker's observation the jobber had been the best dependence of the nut and bolt maker in the recent months of restricted demand. Mr. McKenzie found signs of promise in the deferred demand of which there were evidences on every hand and in the fact that in so many industries the work of readjustment had now been going on for nearly a year.

H. T. Diplock, of the Steel Co. of Canada, gave an informing survey of the course of iron and steel production in the world during the war and in the two years following, referring to the large part the United States had had in supplying the world demand for steel since the armistice. The unfilled wants of the United States and of the rest of the world were made the basis of a hopeful view of the future based in part on the accumulated needs of the railroads, on the shortage of hundreds of thousands of homes in the United States

and on the bountiful crops just ahead. Mr. Diplock's remarks were in line with the optimistic expressions of other speakers. While fully recognizing the extent of the present depression and the amount of readjustment yet to be accomplished, his thought was that the longer look ahead found ample ground for encouragement.

### Jobbing Trade Topics

Two of the sessions were occupied with reports of committees and with the presentation of reports by individuals dealing with trade questions in various departments of the iron and steel jobbing trade.

### Exchanging Overstock

F. M. Butts, Butts & Ordway Co., Boston, in an address on "Distribution of Jobbers' Overstock," said that whatever the cause and whatever the reluctance to admit it, a good many jobbers had some kind of stock on hand that they would be quite willing to have owned by some one else. In some cases a cut price had been resorted to to unload merchandise, but it was a question whether anybody had profited by this method. Referring particularly to the group of jobbers handling motor accessories, the speaker told of the method adopted by such jobbers in New England. Lists of overstock have been prepared and sent by each jobber to others. It was generally understood that goods listed on overstock sheets would be sold at the same price manufacturers would charge if the jobber were to go to the manufacturer to purchase. The jobber selling, however, is often willing to sacrifice whatever freight he has paid. In handling such items as machine bolts it would be easy for heavy hardware jobbers to use the present market price of 60 per cent f.o.b. Pittsburgh, and adding freight. If obsolete material has to be sold at a sacrifice price, such price is noted on the overstock sheet.

Emphasis was put on the desirability of keeping a file of overstock lists of competitors and using these when ordering goods. The jobber should see that his own list is kept before the attention of competitors and should not be afraid of helping a competitor to look big to manufacturers at the risk of his own prestige. In the whole matter of exchange or liquidation of overstock there is a chance for a practical application of the golden rule.

### Cultivate the Smaller Trade

Henry W. Wendt, president Buffalo Forge Co., Buffalo, emphasized the importance of canvassing the smaller possibilities of business. The absence of large contracts caused some business men to take too pessimistic a view of the situation. Perhaps the tendency is too much to look to the high average of 1919 and 1920. It would be better to direct attention to the business in 1913 and take that as a basis of comparison. The abnormal period following the war created a state of mind that made the average man loath to get back to the old basis. To-day it is the little man in the middle who offers the best chance of activity and the speaker felt convinced that if every business opportunity, no matter how small, were taken advantage of, the results would be better than some current views would indicate. An agent of his company had gone on a scouting mission in Central America which might not commend itself to some, but he brought back reports of opportunities there which would have been considered quite satisfactory in ordinary times. "What we have got to do," he said, "is to go out and look for the little things."

C. O. Hadly, Alan Wood, Iron & Steel Co., Philadelphia, in dealing with the sheet situation, referred to the multiplicity of uses for sheets in railroad cars, tanks, wheelbarrows, barrels, building, automobiles, etc., and of the great expansion in demand from the day when a ton of sheets was the product of a turn. The 400 sheet mills in the United States are probably operating at 20 per cent capacity and manufacturers fully appreciate the difficulties of present conditions, particularly the increment in cost due to high freights all along the line from raw materials to the finished product. The speaker was disposed to take a hopeful

view of the outcome and above all things deprecated the paralyzing effects of fear.

### Reports From Trade Sections

C. M. Power, U. S. Chain & Forging Co., in reporting on chain, confessed his inability to see how the United States could get along with as little chain as had gone into consumption in the past six months. He alluded to the revolutionary effect of electric welding on the chain industry and to the economies that could be effected through the further standardization of sizes. A. E. Mountford, of Drummond, McCall & Co., Montreal, told of the history and merits of hand-made chain of Staffordshire iron and of its continued manufacture under substantially the old-time conditions.

The report of the iron and steel committee was presented in executive committee by E. McK. Froment, New York; A. J. Bragg, Egleston Bros. & Co., New York, reported for the transportation committee; M. H. Chapin, Bridgeport, Conn., for the committee on cost of doing business; T. W. Kiley, Thomas W. Kiley & Co., Brooklyn, for the bolt and nut committee; Fred Guethlein, G. B. Schulte Sons Co., Cincinnati, on blacksmiths' supplies, and A. C. Dietrich, E. Scott Payne Co., Baltimore, on wagon and carriage supplies. Mr. Sexsmith, Chicago, reported on horse shoes.

### Elimination of Waste

A paper by Herbert W. Lockwood, Edgar T. Ward's Sons Co., New York, on "Much Water Goeth by the Mill that the Miller Knoweth Not Of," dealt with sources of waste in the jobbing trade. Concerning the so-called discount and the carrying of unprofitable lines the speaker said:

If, after deducting all costs, a business over a suitable term of years shows a true net return of 3 per cent on the net sales, that business is a success. This 3 per cent of true net return is being continually assaulted by bad practices. One of them is the cash discount given but not earned. No customer would ask you for a discount amounting to from 20 to 30 per cent of your net profits on the sale of an article. That would be ridiculous; but that is what you give him when you grant a 1 per cent cash discount for payment on the 10th or 15th of the month following. Unfortunately that discount has been allowed, and is probably now being allowed in certain parts of the country. I know of one company, fairly strong in its discount policy, whose discounts allowed are almost negligible, and a second doing almost the same amount and class of business with a lax policy, whose allowances on this item were equal to 25 per cent of the actual true net profit.

A cash discount must produce cash promptly, so that the discount giver can balance by being a discount taker. If it does not, it is simply a method of cutting prices. Though shown as part of the overhead it should be shown as a reduction in price, which it is. The largest and most successful houses have the stiffest discount policies, and the largest and most successful houses know the most about themselves. They know the lines that actually pay, they know the policies that pay, and those that do not. They know that the ways of our fathers and our own early days were good, but that those ways need the keen whetstone of applied observation to maintain for the future the net returns that ought to be realized, and that is the reason for their continuing success.

Why do we all maintain unprofitable lines? To help our tonnage? To help our overhead? Because our customers demand them? There are some arguments in favor of this practice, but most of them will not hold water. An article that chronically does not produce its overhead, that gives no hope of within a reasonable time producing its overhead, and which is truly subject to all components of that overhead, is a leak and cannot be anything else.

### Secretary's Report

Secretary A. H. Chamberlain in his report, which dealt with some of the trying experiences of the past six or seven months following the quick transition to a buyer's market last fall, described a plan on which he has been working for the collection of information and the issuing of reports regarding the condition of trade. In part the idea follows the system used by the Federal Reserve Bank of Philadelphia. In the blanks this bank sends to certain members of the wholesale hardware trade in its district, it calls for the totals of net sales during the month, accounts outstanding at the end of the month, and ratio of



accounts outstanding to net sales for the month, comparisons on each item being made with the previous month and the corresponding month one year previous. The firms reporting to the Philadelphia bank do so under a number. Subsequently each firm reporting receives a confidential report from which it can check up its own figures in percentages with those of other correspondents. It is probable that a similar plan will be adopted by the American Iron, Steel and Heavy Hardware Association.

#### New Officers

The final session of the convention was held on Thursday morning, June 9, and disposed of various business matters. The selection of the next place of meeting was referred to the executive committee. Washington and Atlantic City have been favored, but there is also sentiment in favor of the Central West.

The report of the nominating committee was brought in and by its adoption the convention elected the following for the ensuing year:

President—Andrew Wheeler, Morris Wheeler & Co., Philadelphia.

First Vice-President—W. L. Niekamp, Beck & Corbitt Iron Co., St. Louis.

Second Vice-President—J. B. Carse, Ogden & Wallace, New York.

Executive Committee for three years—Calvin Sohl, Griswold-Sohl Co., Columbus, Ohio; H. L. Simon, Foucar, Roy & Simon, Inc., San Francisco; for one year, A. C. Dietrich, E. Scott Payne Co., Baltimore.

Continuing members of the board—C. W. Henderson, A. C. Harvey Co., Boston; A. J. Lockwood, Edgar

T. Ward's Sons Co., New York; C. R. Williams, Williams Hardware Co., Minneapolis.

Mr. Wheeler's election as president is a recognition of his service at Washington during the war as chief of the warehouse division of the War Industries Board. At the convention in 1919 he was made a vice-president and was thus in line for the presidency. In taking the chair he referred to the fact that each of the two preceding presidents had had in their term of office both favorable and unfavorable business conditions. He was disposed to look for some resemblance in his own term of office. While his predecessor had seen prosperity in the first half of his term and then depression, Mr. Wheeler looked for a better state of things in the second half of the next twelve months than was likely to exist in the first half of his term.

#### Entertainment

Among the social features of the meeting in which about 50 ladies participated were an informal reception and dance at the Windsor Hotel, tendered by the Canadian jobbers on Tuesday evening, June 7, and a dinner dance given by the association itself on Wednesday evening. At the latter there was an entertainment of music and of readings from the poems of Drummond, the French-Canadian Whitcomb Riley. Of particular interest were a few responses from members called out by C. M. Roehm, of Detroit, an ex-president. E. P. Sanderson, of Boston, another ex-president, spoke happily of the features of the association's earlier history, and other good speeches were by E. R. Yarnelle, American Horse Shoe Co., Phillipsburg, N. J., and W. M. Brezette, Bryden Horse Shoe Works, Catasauqua, Pa.

## RECESSIONS IN STEEL PRICES

### Percentages of Decline in Great Britain Greater Than for the United States

Recessions in British prices for steel and iron products have gone to an extent not wholly appreciated on this side of the water. The drop in most items,

than those prevalent in Great Britain at that time.

Prices of June 22, 1920, were taken as the starting point for the British figures, because that marked the peak of a gradual rise through the spring months. American figures are taken a year apart, and thus depict a fall through 52 weeks, instead of 50.

Quotations in Great Britain at present are largely nominal, of course, for the stagnation produced by the continuance of the coal strike makes it almost impos-

Course of Prices During the Past Year, as Quoted by THE IRON AGE—Prices per Gross Ton

	British Prices			American Prices		
	June 22, 1920	June 7, 1921	Reduction Per Cent	June 8, 1920	June 7, 1921	Reduction Per Cent
Coke .....	\$12.55 (a)	\$7.92	37	\$14.00 (b)	\$3.25	77
Basic iron .....	45.50 (c)	22.62	50	43.50 (d)	21.00	52
Foundry iron .....	41.00 (c)	22.62	45	43.00 (e)	21.50	50
Ferromanganese .....	160.00	65.98	59	250.00 (f)	80.00	68
Ship or tank plates .....	136.00	71.63	47	78.40 (f)	44.80	43
Beams and channels .....	130.50	66.45	49	69.44 (f)	49.28	29
Billets .....	110.00	47.13	57	60.00 (f)	37.00	38
Rails, open-hearth .....	100.00	56.55	43	57.00	47.00	18
Steel hoops .....	156.00	75.40	52	112.00 (f)	61.60	45
Steel bars .....	134.00	62.21	54	78.40 (f)	47.04	40
Sheet bars .....	128.00 (g)	43.36	66	80.00 (f)	39.00	51
Black sheets .....	216.00	75.40	65	123.20 (f)	86.24	30
Galvanized sheets .....	240.00	84.83	65	156.80 (f)	112.00	29
Tin plates (per base box) .....	14.20	5.47	61	7.84 (h)	7.00	11

(a) Durham. (b) Connellville. (c) Cleveland. (d) Valley furnace. (e) Chicago. (f) Pittsburgh. (g) Welsh. (h) Figured at 112 lb., to match the British box.

while still leaving the figures higher than here, has been at a larger percentage than in the United States. A part of this decrease has been due to a fall in exchange, for the accompanying figures are all quoted in dollars; but the result is attributable mainly to concessions in quotations based on pounds sterling.

Only in coke, pig iron and ferromanganese, of the fourteen items compared, have the American percentages of price fall been greater than those for Britain. The extent of the drop in American coke prices is due largely to the inflated price of coal last year; in ferromanganese, to the import situation. In only four items—black, galvanized and tinned sheets and ferromanganese—are present United States prices above those quoted in England. In three items—coke, foundry iron and ferromanganese—our prices a year ago were higher

sible either to manufacture or to transport steel. Such as they are, however, they represent the complexion of the market of to-day, and thus form a ready basis for comparison.

The Lancaster Iron Works, Inc., Lancaster, Pa., has recently acquired the electric furnace business of F. T. Ryan & Co., Philadelphia, and production in the future will be arranged at the Lancaster plant. The Ryan company will continue as representative for the electric furnace business in its territory.

The regular monthly meeting of the New York Section of the Industrial Cost Association will be held at the Bush Terminal Sales Building, 132 West Forty-second Street, on Thursday, June 16, at 6.30 p. m.

## Evolution in French Iron and Steel

(Continued from page 1624)

This French company extended its power by becoming minority stockowner (40 per cent) of a new Bavarian company organized at Homburg by Stumm to continue the operations of the open-hearth and rolling mills and pipe works located beyond the frontier of Gallic influence.

Transactions of minor importance were numerous, such as the acquisition by the engineering works Chavanne-Brun Co. of the Kammerich shops near Thionville for 2,400,000 fr.; the sale of the Basse-Yutz works of Stähler and Co. to the French concern Leflaive & Co., St. Etienne; the Bouzonville foundries and shops by the Etabl. Delattre & Frovard Reunis, the passing of the control of Ehrhardt & Sehmer G.m.b.H. into the hands of the Societe Alsacienne de Constructions Mecaniques de Belfort and the reorganization by the Simon-Carvès interests of the Méquin factory of Dillingen (Sarre).

Through the obstinacy of their owners the large Roehling enterprises located at Voelklingen remain the only German controlled plant of the Saar in spite of the forced sale of their mining interests located in Lorraine.

No account of these changes is complete without mentioning the formation of the Societe Metallurgique des Terres Rouges that superseded the Gelsenkirchen company in the control of their properties situated in Luxemburg and in the Aachen district and the creation of the "Hadir," the Societe des Hauts-Fourneaux et Acieries de Differdange-St. Ingbert et Runnelange, that was accepted by the Luxemburg government as new owner of the old Deutsch-Luxemburg properties sold by Stinnes for 160,000,000 fr. The French interests are made up of Homécourt-Micheville, Acieries de France et Forges du Nord et Est. The Belgian subscribers are Ougrée-Marihaye and Angleur. The old shareholders of the German company have a privilege of subscription to the stock of the new company up to 25 per cent [compare with the author's article on Germany in THE IRON AGE of May 19, 1921, p. 1321].

The year 1920 passed with the digestion of these multiple changes of financial nature and was characterized by a wave of frantic speculation and extreme prices in the early months and the inevitable slump of affairs that is still continuing all over the world. It sobered many minds and recalled the physical limitations of the industrial activities and the extremely important influence of the transportation problem in the organization of any country, as well as the strain of the political situation. In France the shrinkage of the sales brought very forcefully to light the value of export trade, because the productive capacity of the iron and steel industry exceeds the home consumption enormously in spite of the inevitable increased capacity of the internal market.

The well-known expert, Leon Guillet, figures that France is materially forced to export some 17,000,000 tons of iron ore, about 250,000 tons of pig iron and over 2,500,000 tons of steel in blooms, billets or other rolled shapes out of a total 8,500,000, or some 30 per cent. This necessarily creates a completely new phase in the history of the French industry, and is far from being solved. The situation is furthermore complicated by the position of the Luxemburg plants exporting over 95 per cent of their products and by the Belgian mills that always were exporters of three-quarters of their output. The break down and final dissolution of small local sales organizations like the Comptoir de Longwy for pig iron and ores are an added feature that seems to prove that the sales end of the French industry is still imperfect and will cause further developments.

The first step was the broadening extension of the activities of several nation wide sales organizations into one stronger unit, as represented by the Comptoir Siderurgique de France. This within the borders of France controls nearly all semi-finished products and rails and beams. Private initiative created aggressive sales pools like the "Columeta," the "Segogo," and others with ambitious export policies. Those activities

showed the way and the latest events seem to prove that the French industry is entering into a second period of integrations that still further reduces the number of financial groups controlling its complete output. These fusions will have the inevitable consequence of specialized plants and consolidated sales organizations.

During the last months the first child of this evolution was born. The Nord et Est consolidation is made up by the Societe des Forges et Acieries du Nord et Est, the Societe Metallurgique de Basse-Loire and the Uckange Co. controlling the old Stumm properties located in Saar-Lorraine district. The heart of this huge aggregate is formed by the Banque de Paris et des Pays-Bas; but it seems that the big industrial leaders control the bank also. This large integration controls plants and mills with 2,000,000 tons yearly steel capacity after destroyed furnaces are rebuilt (actual capacity about 1,200,000 tons of pig iron) and adequate reserves in ores and coal. It proposes to take aggressive steps toward efficient trade organization by using to advantage the favorable geographic location of their various plants located in Valenciennes, Trith St. Leger, Louvroil in the North; Trignac, near Nantes; Jarville, near Briey; Ukange near Thionville (Lorraine), and Neunkirchen, near Saarbrueck.

The outside observer cannot help compare this evolution to that going on in Germany, where the principal of integrating big industrial plants and concentration of large economic activities in a small number of powerful hands goes on with the same intensity. The methods are different to conform with the contrasting mentalities of the two countries, but the results are very much alike. These developments will bear heavily on the coming international competition, as the interdependence of all the nations is an accepted economic axiom to-day.

## HIGH-SPEED STEEL

### Normal Annual Output 15,000 Tons—Decline in Last 12 Months

BY C. E. BREGENZER

It is estimated that the annual production of high-speed steel in the United States is about 15,000 tons. This figure was reached in the last six months of 1919 and the first six of 1920. In 1918 the amount used was approximately 21,000 tons. Owing to very restricted demand the output for the latter part of 1920 and the first part of 1921 will fall short of normal, estimates ranging from 1000 to 3000 tons.

Due to more modern methods of production and the fact that high-speed steel has to some extent taken the place of carbon steel in the tool industry, progress in production in the United States has been such that 1920-21 figures will exceed the normal output of the pre-war years of 1913-14. Prior to that period large quantities were imported from England and Germany.

High-speed steel has a wide field of application in the metal-working industries. It is used for all kinds of metal cutters where a considerable amount of material is to be removed. The following is a list of the principal uses:

Twist drills	Dies
Lathe tools	Hobs
Planer tools	Taps
Milling cutters	Countersinks
Forming cutters	Punches
End milling cutters	Screw machine tools
Inserted tooth cutters	Shear disks
Metal cutting saws	Shear blades
Broaches	Cutter blades
Automobile valves	Twist drills
Reamers	

During the last six months of 1919 and the first six of 1920, high-speed steel to the approximate value of \$25,000,000 was used for twist drills. Of this amount the automotive industry used approximately 41 per cent; the machinery and metal goods manufacturers, 31 per cent; railroads, 1 per cent; shipbuilding, 11 per cent.

The following is the order of States according to consumption: Michigan, Ohio, New York, Pennsylvania, Illinois, Connecticut, Massachusetts, New Jersey, Indiana, Rhode Island, Wisconsin, Maryland, Missouri.



# Prices Finished Iron and Steel, f.o.b. Pittsburgh

## Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia .....	\$0.35	St. Paul .....	\$0.665
Baltimore .....	0.335	Omaha .....	0.815
New York .....	0.38	Omaha (pipe) .....	0.77
Boston .....	0.415	Denver .....	1.35
Buffalo .....	0.295	Denver (wire products) .....	1.415
Cleveland .....	0.24	Pacific Coast .....	1.665
Cincinnati .....	0.325	Pacific Coast, ship plates .....	1.335
Indianapolis .....	0.345	Birmingham .....	0.765
Chicago .....	0.38	Jacksonville, all rail .....	0.555
St. Louis .....	0.475	Jacksonville, rail and water .....	0.46
Kansas City .....	0.815	New Orleans .....	0.515
Kansas City (pipe) .....	0.77		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 70c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, \$1; wire fencing, netting and stretcher, \$1; pipe, not over 8 in. in diameter, 85c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

## Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zeeks, structural sizes, 2.20c.

## Wire Products

Wire nails, \$3 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50 and shorter than 1 in., \$2; bright Bessemer and basic wire, \$2.75 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$2.75; galvanized wire, \$3.45; galvanized barbed wire, \$3.85; galvanized fence staples, \$3.85; painted barbed wire, \$3.15; polished fence staples, \$3.15; cement-coated nails, per count keg, \$2.60; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ to 63 per cent off list for carload lots, 59½ to 62 per cent for 1000-rod lots, and 58½ to 61 per cent for small lots, f.o.b. Pittsburgh.

## Bolts, Nuts and Rivets

Large structural and ship rivets.....\$3.10 to \$3.15  
Large boiler rivets.....3.20 to 3.25  
Small rivets.....60, 10 and 10 per cent off list  
Small machine bolts, rolled threads.....60, 10 and 10 per cent off list

Same sizes in cut threads.....60 and 10 per cent off list  
Longer and larger sizes of machine bolts.....60 per cent off list  
Carriage bolts, ½-in. x 6-in.:  
Smaller and shorter, rolled threads.....60 and 5 per cent off list

Cut threads.....50, 10 and 5 per cent off list  
Longer and larger sizes.....50 and 10 per cent off list  
Lag bolts.....65 per cent off list  
Plow bolts Nos. 1, 2 and 3 head.....50, 10 and 5 per cent off list

Other style heads.....20 per cent extra  
Machine bolts, c.p.c. and t. nuts ½-in. x 4-in.:  
Smaller and shorter.....50, 10 and 5 per cent off list

Longer and larger sizes.....50 and 5 per cent off list  
Hot pressed sq. or hex. blank nuts.....\$4.00 off list  
Hot pressed nuts, tapped.....\$3.50 off list

C. p. c. and t. sq. or hex. nuts, blank.....\$4.00 off list  
C. p. c. and t. sq. or hex. nuts, tapped.....\$3.50 off list  
Semi-finished hex. nuts:

¼ to 9/16 in. inclusive U. S. S.....80 and 10 per cent off list  
Same sizes S. A. E.....80, 10 and 10 per cent off list  
% to 1 in. inclusive U. S. S. and S. A. E.,  
70, 10 and 10 per cent off list

Stove bolts in packages.....80 and 10 per cent off list  
Stove bolts in bulk.....80, 10 and 2½ per cent off list  
Tire bolts.....65, 10 and 10 per cent off list

Track bolts.....4.35c. base  
Square and Hex. Head Cap Screws  
¾ in. and under.....70 per cent off list

9/16 in. to ¾ in.....70 per cent off list  
Set Screws  
¾ in. and under.....70 and 5 to 70 and 10 per cent off list

9/16 in. to ¾ in.....70 per cent off list  
Rivets  
Rivets, 1c. per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

## Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$48; chain rods, \$48; screw stock rods, \$53; rivet and bolt rods and other rods of that character, \$48; high carbon rods, \$58 to \$73, depending on carbons.

## Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$3.25 to \$3.40 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ¾-in., and 7/16-in., \$3.40 base; 5/16-in., \$3.40 base. Boat and barge spikes, \$3.40 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, \$4.35 base per 100 lb. Tie plates, \$2.50 per 100 lb.; angle bars, \$2.75 per 100 lb.

## Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$12.30 per package; 8-lb. coating, 1 C., \$12.60; 12-lb. coating, 1 C., \$14.30; 15-lb. coating, 1 C., \$15.30; 20-lb. coating, 1 C., \$16.55; 25-lb. coating, 1 C., \$17.80; 30-lb. coating, 1 C., \$18.80; 35-lb. coating, 1 C., \$19.80; 40-lb. coating, 1 C., \$20.80 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

## Iron and Steel Bars

Steel bars at 2.10c. from mill. Refined bar iron, 2.75c.

## Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/8 to 3/8	50 1/2	24	1/8 to 3/8	27 1/2	9 1/2
1/2 to 3/4	52 1/2	26	1/2 to 3/4	27 1/2	9 1/2
3/4 to 1	56 1/2	42	3/4 to 1	33 1/2	18 1/2
1 to 1 1/2	60 1/2	48	1 to 1 1/2	35 1/2	20 1/2
1 1/2 to 3	62 1/2	50			
			Lap Weld		
2	54 1/2	42	2	30 1/2	16 1/2
2 1/2 to 6	58 1/2	46	2 1/2 to 6	33 1/2	20 1/2
7 to 12	54 1/2	41	7 to 12	29 1/2	16 1/2
13 to 14	45	..			
15	42 1/2	..			
			Butt Weld, extra strong, plain ends		
1/8 to 3/8	46 1/2	29	1/8 to 3/8	10 1/2	43 1/2
1/2 to 3/4	48 1/2	31	1/2 to 3/4	26 1/2	14 1/2
3/4 to 1	53 1/2	42	3/4 to 1	33 1/2	19 1/2
1 to 1 1/2	58 1/2	47	1 to 1 1/2	35 1/2	21 1/2
1 1/2 to 3	60 1/2	49			
	61 1/2	50			
			Lap Weld, extra strong, plain ends		
2	52 1/2	41	2	31 1/2	18 1/2
2 1/2 to 4	56 1/2	45	2 1/2 to 4	34 1/2	22 1/2
4 1/2 to 6	55 1/2	44	4 1/2 to 6	33 1/2	21 1/2
7 to 8	50 1/2	37	7 to 8	24 1/2	12 1/2
9 to 12	45 1/2	32	9 to 12	19 1/2	7 1/2

To the large jobbing trade an additional 1, 5 and 2½ per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

## Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		Charcoal Iron	
1 1/4 in.	19 1/2	1 1/2 in.	+10
2 to 2 1/4 in.	30	1 3/4 in.	List
2 1/2 to 3 in.	41	2 to 2 1/4 in.	-10
3 1/4 to 13 in.	47	2 1/2 to 2 3/4 in.	-15
		3 to 3 1/4 in.	-16
		3 1/2 to 4 1/2 in.	-20

## Carload Discounts on Standard Commercial Seamless—Cold Drawn

1 in.	56	2 to 2 1/2 in.	17 1/2
1 1/4 in.	49	2 3/4 and 4 in.	20
1 1/2 in.	48	4 1/2 to 5 in.	7 1/2
1 3/4 in.	25		

## Hot Rolled

3 to 4 in.....30

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

## Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed		Cents per Lb.	
No. 8 and heavier	2.80-3.00	Nos. 11 and 12	2.95-3.15
No. 9 and 10		Nos. 13 and 14	3.00-3.20
(base)	2.90-3.10	Nos. 15 and 16	3.10-3.30

Box Annealed, One Pass Cold Rolled		Cents per Lb.	
Nos. 17 to 21	3.65-3.80	No. 28 (base)	3.85-4.00
Nos. 22 to 24	3.70-3.85	No. 29	3.95-4.10
Nos. 25 and 26	3.75-3.90	No. 30	4.05-4.20
No. 27	3.80-3.95		

## Galvanized

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	4.00	Nos. 25 and 26	4.70
Nos. 12 to 14	4.10	No. 27	4.85
Nos. 15 and 16	4.25	No. 28 (base)	5.00
Nos. 17 to 21	4.40	No. 29	5.25
Nos. 22 to 24	4.55	No. 30	5.50

## Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	3.65-3.80	No. 28 (base)	3.85-4.00
Nos. 17 to 21	3.70-3.85	No. 29	3.90-4.05
Nos. 22 to 24	3.75-3.90	No. 30	3.95-4.10
Nos. 25 to 27	3.80-3.95	Nos. 30 1/2 and 31	3.95-4.10

## Non-Ferrous Metals

### The Week's Prices

Cents per Pound for Early Delivery							
Copper, New York			Tin	Lead		Zinc	
June	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
8	....13.00	13.00	29.37 1/2	4.75	4.45	5.00	4.50
9	....13.00	13.00	29.25	4.75	4.45	5.00	4.50
10	....13.00	12.87 1/2	29.00	4.50	4.25	4.95	4.45
11	....13.00	12.87 1/2	....	4.50	4.25	4.95	4.45
13	....13.00	13.00	29.00	4.50	4.25	4.95	4.45
14	....13.00	13.00	29.25	4.50	4.25	4.95	4.45

NEW YORK, June 14.

There is still no improvement reported in most of the markets. Buying of copper is confined to small lots with the price tendency firm in some quarters and easy in others. There has been a fair amount of tin purchased by dealers and consumers. Both the lead and zinc markets are inactive and there has been a slight decline in prices.

#### New York

**Copper.**—The unsettlement in exchange continues to act as a damper upon foreign buying, and there has been no incentive for domestic consumers to enter the market. Buying is therefore confined to small lots for early needs. There is also the consideration that purchases in May, both for export and domestic use, were fairly heavy. The result is a waiting market and an exceedingly dull one. The leading producers are either out of the market or refusing to quote less than 13.50c., delivered, for June-July. One or two other sellers are willing to sell a limited amount at 13.25c., delivered, or slightly less. It is therefore possible to buy small quantities of electrolytic copper as low as 13.12½c., delivered, or 12.87½c., New York, but to obtain any substantial amount it would be necessary to pay 13.25c., delivered, or 13c., New York, for early delivery, which we quote as the market. Lake copper is practically on a parity with the latter quotation, although some will not sell at less than 13.50c. for early delivery.

**Tin.**—Up to the end of last week a fair business was reported to have been done, dealers being the principal buyers, but consumers also participated. It is estimated that 600 to 800 tons changed hands up to Friday night, although the market was quiet on the surface. On the whole, the market was irregular, however, and rather difficult to quote, due to the fluctuations in sterling. Further business was reported yesterday at 28.75c. for future shipment Straits tin with 29c. asked at the close, the buying being confined to the morning. Spot Straits tin to-day is quoted at 29.25c., New York. The London market, while slightly erratic during the week, was quoted to-day about £2 per ton higher than a week ago with spot standard at £167 10s., future standard £169 10s. and spot Straits £168 per ton. Arrivals thus far this month have been 787 tons with 2000 tons reported afloat.

**Lead.**—The market continues stagnant and uninteresting. The principal event of the week was the reduction late Friday by the leading interest from 4.75c. to 4.50c., both New York and St. Louis, but this was not known in the trade until late yesterday. Very little business is reported in either market, but the independents at St. Louis are quoting lower than the leading interest, the market being appraised at 4.50c., New York, or 4.25c., St. Louis, for early delivery.

**Zinc.**—There is no change and the market is lifeless, with the price tendency slightly lower. Prime Western for early shipment is quoted at 4.45c., St. Louis, or 4.95c., New York. One encouraging feature is that galvanizers buy for immediate needs when they enter the market, indicating that their stocks are extremely low. There has been a fair demand recently for brass special.

**Antimony.**—The market is quiet, with wholesale lots for early delivery unchanged at 5.20c., New York, duty paid.

**Aluminum.**—The leading interest continues to quote virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery at 28c., f.o.b. plant, with the foreign metal of the same grade offered by other sellers at 22.50c. to 23.50c., New York.

**Old Metals.**—The market is very sluggish and values have an easier tendency. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.50
Copper, light and bottoms	9.75
Heavy machine composition	12.00
Brass, heavy	7.75
Brass, light	6.00
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	5.75
Lead, heavy	4.25
Lead, tea	3.25
Zinc	3.25

#### Chicago

JUNE 14.—Copper, tin, lead and zinc have declined. The sharpest drop was in lead, which metal the leading smelter reduced ½c. to 4.50c. Lead can be bought for 4.35c., however, from independent sources. Tin has weakened both because of a decline in the London market and the recent drop in sterling exchange. A considerable amount of tin has been bought by consumers on the decline, this being the first time the consuming trade has been a factor in the market for several months. Zinc has been weak for several days but seems to be stiffening now. A fair amount of this metal also has been purchased by consumers, very little going to dealers. Old metal prices remain unchanged. We quote Lake copper at 13.25c. in carload lots; tin, 30c.; lead, 4.35c.; spelter, 4.60c.; antimony, 7.50c. On old metals we quote copper wires, crucible shapes, 8.25c.; copper clips, 8c.; copper bottoms, 7c.; red brass, 7c.; yellow brass, 5c.; lead pipe, 2.75c.; zinc, 2c.; pewter, No. 1, 17c.; tinfoil, 18c.; block tin, 21c., all these being buying prices for less than carload lots.

#### St. Louis

JUNE 13.—The non-ferrous markets have been rather dull during the week with the final quotation on car lots 4.50c. for both lead and spelter. On less than car lots the prices are: Lead, 5c.; spelter, 5.25c.; tin, 34c.; copper, 14c.; antimony, 7.50c. In the Joplin district ores have dropped somewhat with lead ore, basis 80 per cent, selling at \$50 per ton and zinc blende, basis 60 per cent, \$22.50 per ton. No calamine is moving. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 4.50c.; heavy yellow brass, 7.50c.; heavy red brass, heavy copper and copper wire, 9c.; light copper, 8c.; pewter, 15c.; tinfoil, 18c.; zinc, 3c.; lead, 3.50c.; tea lead, 2c.; aluminum, 9c.

#### National Sheet Metal Contractors' Association

The annual meeting of the National Sheet Metal Contractors' Association of the United States is being held in the Fort Pitt Hotel, Pittsburgh, this week, with 500 members in attendance. Inspection trips will be made to a number of manufacturing plants in Pittsburgh. Follansbee Bros. Co., Pittsburgh, was host to the delegates on an inspection trip to the open-hearth steel works and sheet and tin plate mills at Follansbee, W. Va., on Monday.

Work on the new open-hearth steel works and sheet mill plant of Follansbee Bros. Co., Toronto, Ohio, is going on satisfactorily. The plant will contain four 40-ton open-hearth furnaces and 10 sheet mills. A press is being installed for pressing billets, with a capacity of 10,000 tons per sq. in.

Owing to increased coal imports, the iron industry of Austria was able, in 1920, to produce 120,000 tons of pig iron, compared with 60,000 tons in 1919, says the London *Ironmonger*. One-half of the pig iron was sent to Czecho-Slovakia in exchange for furnace coke. Owing to the lack of coke one company used charcoal. The stocks of scrap-iron in Austria are decreasing.



## Probable Policy of U. S. Shipping Board

(Continued from page 1621)

would prove well nigh fatal. No attempt has yet been made to outline what the policy of the new board will be, but it is known that it will take this and many other points into consideration.

It is understood that the new Shipping Board will hold a meeting in the near future with ship operators and builders, including men prominent in the steel trade, to discuss details relating to the operation, charter, allocation and sale of ships. Discussion also is expected to center around problems that will be faced by the Shipping Board, such as the higher cost of operating American ships as against foreign ships and plans for putting into full operation the Jones law. One of the provisions of this act directs the President to seek an amendment to about 30 commercial treaties which now prevent the United States from imposing discriminatory customs duties and tonnage taxes. Former President Wilson declined to take action on this provision. Predictions are made that President Harding will not hesitate to do so but he also will urge the passage of a bill to exempt American ships from the payment of Panama Canal tolls.

## Amending the War Mineral Act

WASHINGTON, June 14.—Desire of Senators to give further study to its language, indicating that modifications may be made, has resulted in withholding action on the bill introduced by Senator Shortridge, of California, to liberalize the war mineral act of March 2, 1919. The present act limits payment of claims to contracts for supplying the Government during the war with manganese, chrome, and tungsten ore and pyrites. All of these have been passed upon by the War Minerals Relief Commission and all but 50, which are before the Secretary of the Interior, for review, have been settled. The Shortridge bill would provide compensation to all claimants who, in response to personal, written, or published request, on demand from the Department of Interior, War Industries Board, the War Trade Board, Shipping Board or the Emergency Fleet Corporation, in good faith expended money in producing or in preparing to produce any of the minerals named. They would be reimbursed for such net losses as they may have incurred from the unexpended portion of the appropriation of \$8,500,000 carried in the War Minerals Act.

Senator Ashurst of Arizona, in charge of the Shortridge measure, in making a report on it, said that of the 1,207 claims filed, 572 were rejected on the ground that no specific request or demand had been communicated personally to the claimant. He contends that the construction of the act is a narrow one and for that reason has urged its liberalization through further legislation. The rejected claims amounted to \$3,464,023. Deducting the amount of the allowed claims and the expenses of the Relief Commission, there remains of the \$8,500,000, approximately \$4,974,746 unused. If these rejected claims should be allowed and paid in full, there would remain \$1,510,772 unused and if the rejected claims should be allowed and paid at the prevailing rate, there would remain of the appropriation \$3,897,434.

Wage disbursement of \$4,047,641 in May at Youngstown, Ohio, principally by iron and steel interests, compares with \$4,401,960 paid in April and \$6,300,456 distributed in May of 1920. It represents, therefore, a decline of \$350,000 from the April payroll and \$2,250,000 from the corresponding month of the previous year.

The stationary engineers at the power houses of the Cincinnati Traction Co., who went on strike on May 30 for a continuance of their present scale of wages, have returned to work pending the decision of an arbitration board appointed to consider the wage question.

## CUTTING COSTS

### Salaries of Many Officials Reduced—Workingmen Living on Their Savings

YOUNGSTOWN, OHIO, June 14.—Preparing for impending price changes in the iron and steel industry, district makers have been conducting a thorough departmental study of costs in an effort to reduce them to minimum. Operating and other charges have been trimmed and retrimmed. Reduction of overhead by cutting officials' salaries is the latest step in the sweeping readjustment to place costs on a lower level.

All of the larger independents have revised salaries or are about to do so, among them the Republic Iron & Steel Co., Youngstown Sheet & Tube Co., Brier Hill Steel Co., Trumbull Steel Co. and Sharon Steel Hoop Co. Salaries of officials of the Brier Hill company are horizontally reduced 15 per cent on June 16. Other companies have made reductions ranging from 15 to 30 per cent, while in certain cases the cuts have been still more severe.

Prospects of bonuses for officials at the end of the year automatically disappeared with the stagnation in business.

The salary reductions affect all officials from presidents and chairmen of boards down.

"Our officials did not receive salary advances in the same proportion that mill workers' wages were advanced during the war," states an official of the Brier Hill company. "In taking a 10 per cent reduction, they are losing relatively more than mill workers did at 20 per cent. Salaries increased about 70 per cent, and to have made the cut proportionate, it should have been about 10 per cent, as plant operatives were advanced 140 per cent during the war."

Owing both to wage reductions and institution of the 8-hr. day, workers have in many cases sustained wage losses approximating 50 per cent. Still another wage reduction is being considered by some of the larger independent groups.

In both the Mahoning and Shenango Valleys there is a large volume of unemployment, which is likely to be accentuated during July and August. While there has been some exodus from the district, especially of foreigners, most of the mill employees have preferred to remain, living in many cases on their savings. Intermittent employment has, on the other hand, been provided large numbers of men and the inauguration of the 8-hr. day has filled its purpose of affording work for a larger number of men than the longer day would have done.

### The Tin Depression in the Far East

WASHINGTON, June 14.—The Federated Malay States Chamber of Mines, writes U. S. Consul Dickinson, never met under more depressing conditions than it did late in March to discuss the tin situation in the Straits Settlements. The consumption is absorbing about a third to a half of the production of tin. Every effort is being made to reduce the cost of production, which is too great for the effective demand, and reductions in wages and fuel have taken place. The local government has suspended its undertaking to buy up existing stocks of tin at a figure slightly in excess of the cost of production as it was found that continued buying not only accumulated a large unsold stock of the metal but encouraged the maintenance of production. If the present low price was due entirely to the machination of operators on the metal exchange, it is stated, then the government would be strongly urged to continue buying, but this is not the case, as there is every indication that there is an absolute lack of demand, and under these conditions purchases by the government only create a false position. It is thought that by the government's withdrawal from the market the price will recover more quickly than otherwise. When general conditions improve it is believed that tin will be one of the first to recover, as the world's production, as far as it can be ascertained at present, is decreasing and no important tin field has been discovered.

## PERSONAL

Col. Washington A. Roebling, who recently passed his eighty-fourth birthday, has been elected president of John A. Roebling's Sons Co., Trenton, N. J., wire rope manufacturer, succeeding his nephew, Karl G. Roebling, who died suddenly on May 29. Col. Roebling has long been identified with bridge construction projects. His most notable achievement was the completion of the Brooklyn Bridge, this work having devolved upon him after the death of his father, John A. Roebling.

William C. E. Becker has been appointed chief engineer of the department of public safety of St. Louis, effective July 1. He now is a structural engineer for the Missouri Pacific Railroad, and formerly was professor of civil engineering at Washington University.

L. H. G. Bouscaren, who has been in charge of the engineering and construction interests of Stone & Webster, Inc., in Ohio, has taken charge of the central district office in the First National Bank Building, Chicago. During the war he was in charge of the Youngstown, Ohio, office of the company, and later was sent to France as its European representative.

William S. Silpath is now with the Pioneer Wire Works, Camden, N. J., as sales manager. This concern manufactures wire and metal goods and carries in stock wire cloth and fence, wire rope, plain wire and metal goods. His experience in this line covers over 25 years, having been associated with the DeWitt Wire Cloth Co. and its successors, the Rogers Wire Works Co. and the Buffalo Wire Works Co., Philadelphia.

The American Steel & Wire Co. has abolished its New England sales district, which for years has had its headquarters at Worcester for the handling in the New England territory of the specialties made in the district. Hereafter all sales in the district, with the exception of Worcester and Boston and the Metropolitan district, will be handled from the New York sales office. A. F. Walters will continue as the head of the Boston office, in charge of that district. Albert M. Webb, who has been sales agent in charge of springs and other specialties for the New England district, will be the head of the Worcester office. Transferred from Worcester to the New York office are C. W. Whiting of the flat wire department, Otto Sharp of the rope department, and F. K. Sawyer of the spring department.

B. F. Putnam, formerly sales manager Heald Machine Co., Worcester, and recently with the Thompson Electric Welding Co., Lynn, Mass., has joined the Morgan Grinder Co. staff.

William Robert Wilson, formerly a Dodge Brothers Motor Car Co. executive, and until this latest change a vice-president of the Irving National Bank of New York, is the new president of the new Maxwell Motor Corporation, organized by Walter P. Chrysler and others from the Maxwell and Chalmers motor units. Mr. Chrysler remains chairman of the board. W. Ledyard Mitchell, former president of the Maxwell unit, becomes vice-president of the new company.

Wilbur H. Collins, manager Detroit branch, Cadillac Motor Car Co., has resigned to join his father, R. H. Collins, in the Durant Motors organization. He is succeeded by Richard Harfst, who has been in the office of the president of the General Motors Corporation, New York.

Hugo A. Gilmartin, former secretary of the Detroit municipal water board, has been elected treasurer of the American Machine Products Co., Eighteenth and Howard streets, Detroit.

J. C. Stuessi has resigned as secretary and purchasing agent of the Line Material Co., South Milwaukee, Wis., effective June 1. He has been with this company for nine years and is going to take a vacation of two or three months, visiting points in the West.

William N. West, formerly superintendent of the mills and roll shop of the Elyria Iron & Steel Co., Elyria, Ohio, has been appointed general superintendent, succeeding Walter Ferrier, who has severed his connection with the company.

William Chambers, for 25 years with the Garden City Sand Co., Chicago, one of the oldest foundry supply men in the West and familiarly known in the trade as "Uncle Billy," has become associated with the Material Service Corporation, Chicago, in charge of the molding sand and fire brick department.

I. H. Cowdrey, Massachusetts Institute of Technology, was elected chairman of the Boston chapter, American Society for Steel Treating, at the annual meeting held recently at the Engineers' Club, Boston. W. S. McIntosh, S. A. Wood Co., was elected vice-chairman, and Z. L. Sault, Annealing & Tool Co., secretary and treasurer.

James A. Farrell, president United States Steel Corporation, has been elected member of the board of regents of Georgetown University, Washington, succeeding the late Anthony Hirst, Philadelphia.

John C. Spence, works manager, machine division, Norton Co., Worcester, Mass., spoke on "Industrial Medicine and Its Relation to Workers and Production" at a joint meeting of the Associated Industries of Massachusetts and the Employment Managers' Association, at the Copley-Plaza, Boston, June 6.

Robert S. Gans was elected vice-president at a recent meeting of the board of directors of the Raymond Engineering Corporation, New York. He will continue his work as executive in charge of sales, and the development of new products.

A. H. Holliday, export manager Jones & Laughlin Steel Co., will attend a conference in Mexico City, June 20.

A. G. Gardner, formerly superintendent Providence Engineering Corporation, Providence, R. I., is now associated with the Textile Finishing Machinery Co., that city.

J. E. Thropp, Jr., for the past three and a half years blast furnace superintendent at the Columbus, Ohio, plant of the American Rolling Mill Co., has resigned.

Dr. Julius Klein, Harvard University professor, has been sent to the Senate by President Harding for director of the Bureau of Foreign and Domestic Commerce, Department of Commerce. Dr. Klein was born June 27, 1886, in San Jose, Cal., and after attending public and high schools, he attended the University of California and was given the degrees of B. L. T. and M. L. T. from that institution in 1907 and 1908, respectively, while the degrees of A. M. and Ph.D. were conferred on him by Harvard in the years 1913 and 1915, respectively. Dr. Klein, who speaks Spanish, German and French, has traveled extensively through Latin-America and was formerly chief of the Latin-American division of the Bureau of Foreign and Domestic Commerce and later was commercial attache at Buenos Aires, Argentina.

Hugh Rockwell, formerly president and general manager Standard Steel & Bearings Co., Plainville, Conn., who is interested in aeroplanes, has transferred his activities to the Harding-Zuck-Poole Co., Lincoln, Neb.

F. C. Carts has been transferred from the Columbiana, Ohio, works of the Columbiana Foundry Co. to the McKeesport, Pa., works and has been appointed general inspector.

E. L. Koenig, formerly assistant sales manager J. T. Ryerson & Son, Chicago, has been elected vice-president and a director of the Hughes Steel Equipment Co., Allegan, Mich. W. H. Shirley, Allegan, has also been elected to the directorate.

L. D. Maxon, purchasing agent Olds Motor Works, Lansing, Mich., has resigned to take a similar position with Edward Ver Linden, manager of the Lansing division of Durant Motors, Inc.



## OBITUARY

**WILLIAM BROWN COGSWELL**, founder of the Solvay Process Co., Syracuse N. Y., and a prominent mining and mechanical engineer, died of blood poisoning at his home in New York on June 7 at the age of 87. He was born at Oswego, N. Y., Sept. 22, 1834, and attended the Rensselaer Polytechnic Institute for two years, receiving the honorary degree of civil engineer in 1884. He was a mechanical engineer in the navy during the Civil War and then became superintendent of the Franklin Iron Works, Syracuse, N. Y. Upon hearing a paper on the manufacture of ammonium carbonate, read by Oswald J. Heinrich, mining engineer of Drifton, Pa., before the American Institute of Mining Engineers in 1879, it occurred to him that such an industry could be established at Syracuse. He went to Europe to make a study of the soda industry and was commissioned by Solvay & Co., Belgium, to locate a plant in the United States in 1881. The plant at Syracuse was then capitalized at \$300,000, which is now at \$36,000,000. Mr. Cogswell belonged to over 100 scientific societies, social organizations and clubs, including the American Society of Mechanical Engineers.

**WALTER WAGHORN**, New York representative of the Gem Mfg. Co., Pittsburgh, manufacturer of steel specialties, died on June 5 at the age of 65. He had been in this position for 20 years.

**QUARTUS ALMON GILLMORE**, superintendent of the ore docks of the American Steel & Wire Co. in Cleveland, and well known in the iron ore trade, died at his home in Lakewood, a suburb of Cleveland, June 9, aged 60 years.

**JAMES PRENTICE SNEDDON**, who died on June 11 at Johns Hopkins Hospital in Baltimore after undergoing two operations, has left a record of executive ability and technical knowledge written deeply in the history of the boiler industry. He was born in Newmains, Scotland, on July 7, 1863, but came to the United States when 14 years old. The first important position he held was as master mechanic of the Crystal Plate Glass Co. at Crystal, Mo., but returned shortly as manager to the Rankine & Fritsch Co., St. Louis, where he learned the machinist's trade. He had nearly completed plans for reorganizing and buying that company when the panic of 1893 rendered this project impracticable. Eventually he was employed by the Hawley Furnace Co., Chicago, where he made the acquaintance of E. R. Stettinius, at that time manager of the Stirling Co. He was first employed by the Stirling Co. in 1899 at its plant at Barborton, Ohio. After the boiler business of the Aultman & Taylor Machinery Co., Mansfield, Ohio, was purchased, Mr. Sneddon became vice-president in charge of manufacturing of the Stirling Consolidated Boiler Co. In 1906, when the Babcock & Wilcox Co. took over this combination, he became general superintendent and directed manufacturing policies until his death. He was also vice-president of the Pittsburgh Seamless Tube Co., a director of the Mechanics Trust Co., Bayonne, N. J., and a member of the Bayonne Chamber of Commerce. He is survived by a widow, son and daughter.

**ROBERT MATHEWS**, senior member of the hardware firm of Mathews & Boucher, Rochester, N. Y., died May 31 at his home in that city at the age of 79. He was born in Granard, Ireland, July 5, 1842, coming to this country at the age of three. He started his hardware career with the Russel & Erwin Mfg. Co., New York. He went to Rochester in 1868, becoming associated with the late Arthur S. Hamilton, with whom he organized the hardware firm of Hamilton & Mathews, which was changed to Mathews & Boucher about 25 years ago.

**RICHARD PETERS**, who for many years was identified with the steel business and allied industries, died recently at his home in Philadelphia. He was the father of Richard Peters, Jr., manager of sales of the Pulaski Iron Co., Philadelphia. Mr. Peters was born at Atlanta, Ga., on Nov. 2, 1848, and was the son of a rail-

road builder and operator. He attended Rensselaer Polytechnic Institute and was graduated with the class of 1871. In his early life he followed the profession of civil engineer. He came to the North in 1880 and became secretary of the Chester Rolling Mills, afterward the Wellman Iron & Steel Co., Chester, Pa. About 1896 he was appointed district sales agent of the Pennsylvania and Maryland steel companies, which position he held until his retirement from active affairs in 1912. For many years he was a director of the Chester Creek Railroad and was a director of the First National Bank of Chester for 15 years. He was a member of many clubs and patriotic organizations and a member of the American Institute of Mining Engineers since 1884. He was one of the organizers and president of the Chester Street Railway Co. until it was acquired by the Philadelphia Rapid Transit Co.

**MARINO DE LA PENA**, vice-president of the hardware exporting firm of Pena & Co., Inc., 56 Pine Street, New York, died June 9. He was born in Cuba 52 years ago. In 1883 he went to New York, finished public school two years later and obtained employment with Russell & Erwin Mfg. Co., then at 43 Chambers Street, New York. About eight years ago he and others established the present exporting firm to deal with Cuba and Porto Rico.

**JOHN F. MCEASTON**, aged 65, superintendent of the machinery and equipment department of the Pittsburgh Spring & Steel Co. for several years, died Saturday, June 11, at his home in Knoxville, Pittsburgh.

### Building Operations in May

According to figures compiled by the F. W. Dodge Co., building contracts in the 27 northeastern states during May amount to \$242,093,000, compared with \$220,886,000 in April and smaller amounts in the three preceding months. The total to June 1 this year amounts to \$839,357,000, which is 11 per cent ahead of the average at the end of May for the preceding five years. It must be remembered, however, that unit costs are much higher to-day than has been the case in the average of the preceding five years, and hence that the building volume as expressed in dollars is quite different from the building volume expressed in either square or cubic feet. On the latter basis the contracts for construction this year are materially below the average of the preceding five years.

### Production of Bauxite in 1920

According to figures collected by the U. S. Geological Survey, 321,308 gross tons of bauxite was produced in the United States in 1920, as compared with 376,566 tons in 1919. The mines in Saline and Pulaski counties, Arkansas, produced 481,279 tons, or 92 per cent of the total output last year. The production from these mines in 1919 was 333,490 tons. Georgia ranked second, Alabama third, and Tennessee fourth in production, and the combined output of these three States was 40,029 tons in 1920, as compared with 43,076 tons in 1919. The bauxite imported in 1920, most of it from South America and France, amounted to 42,895 tons as compared with 6082 tons in 1919.

A new publication of the Bureau of Standards, Circular Paper No. 100, entitled "Nickel," is one of a series describing the physical properties of metals together with a discussion of the relation of these properties to the composition and treatment of the material. In this one are described the properties of nickel and of its commercially important alloys: Nickel-steel, ferronickel, copper-nickel, and nickel-chromium alloys.

The Brazilian Electric-Metallurgical Co. has undertaken to erect in the Republic an electric steel plant, says the London *Ironmonger*, and in return the Brazilian Government has granted to the company freedom of customs duty for 30 years on the importation of machinery, motors, furnaces, and materials required for the plant, as well as the use of the water-power belonging to the Federal Government.

# Machinery Markets and News of the Works

## NO GAIN IN BUSINESS

### Machine-Tool Orders Still Scarce, Though Inquiries Increase

Plants of the Country Operated at an Average  
Rate of 12 Per Cent in May, 10 Per Cent  
in April

Though there is a better feeling in some machine-tool markets, due to slightly improved inquiry, it cannot be said that business has shown any marked improvement. Some of the inquiries recently put out have inspired a little more confidence because of the probability that actual orders will ensue.

Machine tool plants of the country operated at an average rate of 12 per cent in May, a gain of 2 per cent over April.

The most promising inquiries before the trade are

from railroads. It appears likely that the Illinois Central will close very soon on its extensive list recently issued. The Rock Island may buy a half dozen tools shortly, and the Great Northern Railroad is reported to have bought against recent inquiries.

An official report shows that only 78.6 per cent of the freight cars owned by the railroads of the country are in serviceable condition, and there are prospects that considerable repair work will be let before the end of the year.

Cincinnati machine-tool builders report more inquiry from abroad. Two lathe manufacturers have received good-sized lists from France, American tools being preferred. Other inquiries come from South America, Mexico and Cuba.

In New England public schools are asking for bids on tools, the largest list coming from Manchester, N. H., which requires 15 metalworking machines and several woodworking tools.

## New York

NEW YORK, June 14.

Machine-tool plants of the country operated during May at an average of 12 per cent, which was a gain of about 2 per cent over April. Selling offices in the East are doing about a 10 per cent business. June has brought no improvement in the demand. Current orders and inquiries are mainly for single tools.

Demand for used tools is better than that for new tools, most of the buyers being bargain hunters. One of the sales reported is a 5-in. used Ajax forging machine by F. H. Crawford, 305 Broadway.

Few crane inquiries have appeared the past week and transactions reported were unimportant. The contract for special cranes for the naval air station at Lakehurst, N. J., has been awarded to the Milwaukee Electric Crane & Mfg. Co. and consists of two 6-ton, platform handling, electric overhead cranes and two 2-ton monorail hoists. Among current inquiries is one from the Federal Shipbuilding Co., Kearny, N. J., for a 5-ton, 12-ft. span hand-power crane. The Chinese inquiry being handled through Andersen, Meyer & Co. and the American Trading Co., New York, which calls for a gantry crane to move 220 tons of slag per hr. at a speed of 100-ft. per min., has been closed by the former company and bids submitted to China. The Industrial Equipment Co., 149 Broadway, New York, is receiving bids on a South American inquiry, which calls for 40 1-ton, 10 to 12-ft. boom, gasoline operated, solid rubber tired truck cranes for operation on docks.

Among recent sales are: Niles-Bement-Pond Co., two 75-ton, 40-ft. span overhead traveling cranes to the Pacific Gas & Electric Co., Bartle, Cal.; Shepard Electric Crane & Hoist Co., a 5-ton electric hoist to the Cambria Steel Co., Johnstown, Pa.

The Fairfield Metals Co., New York, has been incorporated with a capital of \$50,000 by W. Olderman and P. Novitz, to manufacture iron, steel and other metal castings. It is represented by Slade & Slade, 200 Broadway.

The Neverfall Trap Corporation, Brooklyn, has been incorporated with a capital of \$100,000 by E. Bossier, L. Bessmer and S. H. Heyert, 5 Beekman Street, New York, to manufacture animal traps and other wire products.

The West 288th Street Garage Co., Inc., 340 East 116th Street, New York, has filed plans for a one-story machine shop and automobile repair works, 25 x 100 ft., on 218th Street.

The Hudson River Foundry Co., Poughkeepsie, N. Y., has been organized by H. B. Vosburgh and C. W. H. Arnold, Poughkeepsie, to manufacture iron, steel and other metal castings.

The International Paper Co., 38 Broad Street, New York,

has completed plans and will break ground at once for its new hydroelectric generating plant on Sherman Island, Glen Falls, N. Y., estimated to cost about \$2,500,000 with machinery. A. H. White, company address, is engineer.

Two five-story, brick, automobile repair and service buildings for company service, 85 x 138 ft., to cost about \$120,000, will be erected at 201-35 East Fortieth Street, by the Cheek Neal Coffee Co., 110 West Fortieth Street, New York. Plans have been filed.

Fire, June 6, destroyed a portion of the plant of the Central Structural Steel Co., 152nd Street and Harlem River, New York, and part of the adjoining works of the American Balsa Co., manufacturer of life boats, refrigerator insulation, etc., with total loss estimated at about \$200,000. The last named company has executive offices at 50 East Forty-second Street.

A new one-story power house will be erected by the Loft Candy Co., Broome and Centre streets, New York, at its plant on Hamilton Street, Long Island City. Tenney & Ohmes, 101 Park Avenue, New York, are engineers.

The Calculating Machine Corporation, New York, has been incorporated with a capital of \$100,000 by H. Luns-mann, F. M. Pennetto and E. Rolph, 535 East 177th Street, to manufacture calculating machines and parts.

The United Electric Products Co., New York, has been incorporated with a capital of \$30,000 by A. Rappaport and M. S. Solomon, to manufacture electric goods. It is represented by Drechsler, Orenstein & Leff, 225 Fifth Avenue.

The National Fireproof Sash & Door Co., 499 Stagg Street, Brooklyn, manufacturer of metallic sash, doors, etc., has filed notice of dissolution under State laws.

Samuel Marer, 1246 Park Avenue, New York, has had plans prepared for a two-story automobile service and repair building, 105 x 108 ft., on University Avenue, near 195th Street, to cost about \$65,000.

Efficiency Units, Inc., New York, has been incorporated with a capital of \$80,000 by C. DeF. Smith, J. C. Magness and E. M. Evarts, to manufacture automobile parts and equipment. It is represented by Emery, Varney, Blair & Hoguet, 149 Broadway.

Kennedy-Toombs, Inc., New York, has been incorporated with a capital of \$1,500,000 by W. Kennedy, F. P. Toombs and H. Kaley to manufacture heaters and heating equipment. T. A. Hill, Woolworth Building, represents the company.

The shipbuilding plant of the Foundation Co., New York, at New Orleans, known as Shipyard No. 12, has been placed on the market. The yard covers an area of 90 acres, and is provided with three shipways.

The Esmarian Wheel Co., Inc., Paterson, N. J., has been incorporated with a capital of \$1,000,000 by George W. Latus, Samuel H. Halladjian and Charles Esmarian, 916



Main Street, to manufacture automobile rims, wheels and kindred products.

The Perth Amboy Auto Body Co., Perth Amboy, N. J., has been incorporated with a capital of \$50,000 by John Joswick, Jr., and Louis Y. Sosin, 217 Smith Street, to manufacture automobile bodies.

The Klecald Stamping & Retinning Co., Jersey City, N. J., has been incorporated with a capital of \$50,000 by Martin J. Klett, Edward Calderio and John Y. Lyons, to manufacture metal containers. George H. Russell, 243 Washington Street, represents the company.

The plant of the Accounting Machine Co., 250 Badger Avenue, Newark, N. J., will be disposed of at public sale, in accordance with a recent order of the United States District Court. Jacob L. Newman is trustee.

E. A. Williams & Son, Livingston Street, Elizabeth, N. J., manufacturers of brass and bronze castings, etc., have had plans prepared for a new one-story foundry, 35 x 60 ft. Henry D. Scudder, Jr., 9 Clinton Street, Newark, is architect.

The Cullen Vapor Heating Co., Jersey City, N. J., has been incorporated with a capital of \$500,000 by Timothy F. Reilly, James A. Kinkead and Thomas J. Cullen, 3 Foye Place, to manufacture heaters and heating apparatus.

The C. S. Mfg. Co., Nutley, N. J., has filed notice of organization to manufacture automatic valves and other mechanical specialties. Carl Schneider, 28 Woodland Avenue, heads the company.

The Art Metal Works, 9 Mulberry Street, Newark, has leased a building, 75 x 100 ft., at 5 Manufacturers' Place, for extensions. It will be equipped for experimental work.

The Union Smelting & Refining Co., St. Charles Street, Newark, has filed plans for a new one-story foundry, to cost about \$10,000.

The Newark Engine & Machine Works, 85 Frelinghuysen Avenue, Newark, has filed notice of organization to manufacture machinery and parts, and operate a general machine shop. Peter A. Butz, 40 Halleck Street, heads the company.

The Zoeller Mfg. Co., 247 Belleville Avenue, Newark, has filed notice of organization to manufacture valve wheels and kindred mechanical products. John G. Zoeller heads the company.

The Belmont Auto Engineering & Repair Works, 208 Belmont Avenue, Newark, has filed notice of organization to manufacture automobile parts and equipment. V. Fresalone, 225 Academy Street, is head.

Fire, June 5, destroyed a portion of the four-story building on Prospect Street, Newark, formerly occupied as a machine shop by the J. S. Mundy Hoisting Engine Co., and now used by a number of industrial concerns, including the Abrasive Machine Supply Co. and the American Composition Co. The loss is estimated at about \$50,000.

## New England

BOSTON, June 13. \*

School projects appear to offer the most likely prospects for machine-tool business at the moment. Bids are asked on 15 metal-working tools, including three 14-in. lathes, three speed lathes, upright drills, universal millers, a 24-in. shaper, cutters and reamer grinders, etc., as well as a number of wood-working tools for a Manchester, N. H., school. Firms are negotiating on a smaller amount of equipment for another school in that city, and Laconia, N. H., asks bids on four small lathes, milling machines, shaper and other equipment for a school, and an appropriation has been made for equipment for a Worcester, Mass., school. Other New England cities, having failed to secure Government surplus equipment, are considering going into the open market.

Several garages and service stations have covered on about a dozen single tools, notably lathes, upright and sensitive drills, and also have been fairly good buyers of electric grinders and other small tools.

Generally, sales have been few and in each instance involved single tools. In a number of prospective cases machine tool builders have given considerable engineering service, only to have the customer turn around and buy a used machine. The feeling still persists among a majority of the smaller machine tool users that anything desired can be found in the second-hand market. Sales reported by the leading local houses for the first 15 days of June are considerably larger than those for the corresponding period last month, however. One inquiry is for lathes from Canadian and Mexican firms, but the rates of exchange are holding up sales. An Attleboro, Mass., pressed steel interest is in the market for a used press. The Barnes Drill Co., Rockford, Ill., and the American Milling Machine Co., Cincinnati, announce slight reductions in some of their list prices.

Interest in the crane market is revived by the sale of a 30-ton 40-ft. span Shaw crane, through Stone & Webster, to

Ohio interests. Seven bids were submitted on this business. Prices ran fairly close, but those on erection costs took a wide range, \$450 to \$1,350. It is anticipated other crane deals will be closed within the next month or so.

Manufacturers' representatives report the market for drills and reamers duller than at any previous period this year. Users assert all kinds of certain makes of drills are offered at concessions of about 7½ per cent. Mill supply houses state business is 40 to 50 per cent below that for the corresponding time last year.

Page & Nettleton, Milford, Conn., real estate brokers, have acquired a one-story building, 39 x 170 ft., which is to be used for light manufacturing purposes.

The Arey Mfg. Co., Worcester, Mass., recently granted a charter to make motor vehicle appliances, is having its product manufactured by Sleeper & Hartley, Inc., that city, pending arrangements for securing a factory of its own. Ralph G. Arey is president, and John C. Avery, Jr., treasurer.

Oliver W. Goodell, 167 Lafayette Street, Salem, is president. Harry H. Steinle, 56 Humphrey Street, Swampscott, vice-president, and Edward R. Fallon, 95 Monument Avenue, Swampscott, treasurer of the Zina Goodell Corporation, Salem, machinery, machinery parts, hardware, hardware specialties, etc., recently incorporated under Massachusetts laws with a capital of \$225,000.

The Springfield Wire & Tinsel Co., Springfield, has been incorporated under Massachusetts laws with Gerald J. Callahan, Holyoke, president; Oliver C. Gilbert, Hartford, Conn., vice-president; and Edward S. Bradford, Springfield, treasurer. Jay F. Boeshore, Newington, Conn., and J. Howard Jones, Springfield, are directors. The company's capital consists of \$50,000 class B preferred, \$100,000 class A preferred and 1000 shares common stock of no par value.

The Cortland Grinding Wheel Corporation, Chester, Mass., has been granted a charter. No president is named in the incorporation papers. Charles J. Ayer, Plymouth, N. H., is treasurer. He and the following constitute the board of directors: E. Bertram Pike, Pike, N. H.; Frank H. Page, Main Street, Longmeadow, Mass.; Charles G. Gardner, 87 Forest Glen Road, Longmeadow; Allen Hollis, 25 Capital Street, Concord, N. H.; Archie D. Robinson, 101 Court Street, Westfield, Mass.; and Maurice Gaudry, Chester. The company owns a 20-acre tract and plant on Huntington Road, Chester, and a 3-acre tract on Elen Street, Cortland, N. Y. The capital consists of 5000 shares common and 3000 preferred stock, no par in each instance.

The Dana Machine Co., 86 Weybosset Street, Providence, R. I., cotton, woolen, silk and paper finishing machinery, expects to begin operations within a month, according to Frederick I. Dana, president. It is capitalized for \$1,000,000 and will specialize in rolls. The Fuller Iron Works, Fox Point, Providence, including a foundry and machine shop, has been acquired and equipped with electric cranes and machine tools. Special machinery is to be added. Mr. Dana formerly was general manager and treasurer Textile Finishing Machinery Co., Providence. P. LeRoy Harwood, treasurer Mariners' Savings Bank, New London, Conn., is treasurer, and Harry M. Horton, vice-president U. S. Finishing Co., Providence, chairman of the board of directors.

The Springfield Bronze Co., Inc., Springfield, Mass., will build a one-story foundry 40 x 64 ft., to cost \$9,500.

The Motor Parts Corporation, Bristol, Conn., has purchased the Garrigus plant on Riverside Avenue from the Bristol Machine Tool Co. The Bryce plant, Forestville, recently was taken over by the new concern, which is capitalized for \$1,100,000.

The Refrigerating Machinery Co., New Haven, Conn., has been incorporated with a capital of \$50,000 by W. L. Harlow, R. S. White and L. N. Udell, 902 Chapel Street, to manufacture refrigerating and cold storage machinery and parts.

The John P. Smith Co., New Haven, Conn., has been incorporated with a capital of \$50,000 by A. W. Chambers and J. P. Smith, 55 Dorman Avenue, to manufacture metal and wire goods.

The Wilson Machine Co., Boston, has filed notice of organization to manufacture machinery and parts. Robert W. Wilson, 1195 Dorchester Avenue, heads the company.

The Danker & Donohoe Co., 462 Brookline Avenue, Roxbury, Mass., has completed plans for a two-story automobile service building and machine shop on Peabody Street, to cost about \$100,000 with equipment.

The New England Power Co., 35 Harvard Street, Worcester, Mass., has preliminary plans under way for a new hydro-electric generating plant on the Deerfield River, near Searsburg, Vt., to cost about \$1,000,000, including machinery.

The American Metallurgical Corporation, Boston, has been incorporated with a capital of \$50,000, to manufacture metal products. Harry O. Breaker is president, and Kristian A. Juthe, Newton Center, Mass., treasurer.

The Baldwin Chain & Mfg. Co., Worcester, Mass., recently

organized with a capital of \$750,000, has taken over the Arcade Malleable Iron Co., of the same city, and will operate the business under the new name. George T. Dewey is president, and William H. Rockenfield, general manager.

The Romer Motors Corporation, 51 Cornhill Street, Boston, has preliminary plans under way for its new automobile assembling plant on Water Street, Danvers, Mass., comprising three one-story buildings, 100 x 800 ft., 100 x 500 ft., and 50 x 100 ft., to cost about \$100,000 with equipment. Albert J. Romer is president and general manager.

The Rockville Iron Foundry Co., Rockville, Conn., has been incorporated with a capital of \$50,000 by A. L. McCarthy and H. C. Murlless, Rockville, to manufacture iron, steel and other metal castings.

The Y. D. Service Garage, Inc., 341 Newbury Street, Boston, is taking bids for the erection of its proposed new six-story automobile service building and repair works, estimated to cost about \$600,000. The Funk & Wilcox Co., 294 Washington Street, is architect.

## Buffalo

BUFFALO, June 13.

The Board of Supervisors of Erie County, 575 Ellicott Square, Buffalo, has plans under way for a one-story automobile service and repair works, 62 x 120 ft., at Hamburg. Bids will be asked at an early date.

The Excel Tool, Die & Machine Corporation, Buffalo, has been incorporated with a capital of \$50,000 by R. A. Anderson, C. O. Falk and J. A. Winlund, to manufacture machinery, tools, etc. It is represented by Reginald F. Penton, Ellicott Square.

Fire, June 6, destroyed the power house of the Montrose Power Co., Chippawa, N. Y., with loss estimated at about \$100,000. It will be rebuilt.

The Northern New York Utilities, Inc., Watertown, N. Y., has arranged for a bond issue of \$1,200,000, for extensions in electric plant, general operations, etc. J. N. Carlisle is president.

The Iroquois Utilities, Inc., Concord, N. Y., is perfecting plans for a new electric power plant.

The Depew & Lancaster Light, Power & Conduit Corporation, Lancaster, N. Y., has plans under way for a new electric power plant.

## Chicago

CHICAGO, June 13.

Railroad lists constitute the sole feature of the market. The Illinois Central has not yet purchased against its extensive list, but is expected to do so soon. The Rock Island will also probably purchase the half-dozen machines it has been inquiring for within a week or two. The Great Northern is reported to have bought at least part of the machines listed in this column on June 2. There is considerable speculation as to whether the reduction in railroad wages will usher in heavy car repairs. In this connection a circular recently issued by the Car Service Division of the American Railroad Association, Washington, is of interest. Attention is called to the fact that the railroads of the country have actually available for service only 78.6 per cent of the cars owned, as compared with 82 per cent a year ago, or a reduction of 15,000 serviceable cars, and the carriers are urged to undertake "the heaviest practicable car repair program, specializing on producing cars fit to transport grain." It is pointed out that the beginning of the wheat harvest in northern Texas and Oklahoma is only two or three weeks off, with indications pointing to the immediate marketing of a larger proportion of the crop than usual. The yield is estimated to be larger than that of 1920, and in addition there is 26 per cent more wheat, 50 per cent more corn and 65 per cent more oats on the farms, as of March 1, than on the same date a year ago.

Aside from possible purchases of machines by the railroads, there is little business in sight, dealers reporting practically no sales thus far in June.

The Machinery Subdivision of the Ways and Means Committee of the Chicago Association of Commerce held a dinner at the Machinery Club, Chicago, on Thursday evening, June 9. Business conditions, especially as affected by the labor problem, were discussed by the speakers, among whom were Joseph R. Noel, president Chicago Association of Commerce; T. E. Donnelley, director Employers' Association of Chicago; William R. Moss, chairman executive committee Chicago Association of Commerce, and Bernard Cahn, director Employers' Association. The committee which conducted the meeting included M. A. Seymour, Charles E. Reed & Co., shoe machinery manufacturers, Chicago, chairman; R. R. Cuthbertson, Manning, Maxwell & Moore;

Fred G. Brooks of F. E. Reddington; C. R. Gregg, Joseph T. Ryerson & Son; Warren D. Howe, Gibson Spring Co., and George M. Pearse, Brown & Sharpe Mfg. Co.

W. J. McDowell and C. B. Burns have formed the McDowell Machinery Co., 550 West Washington Street, Chicago, and will handle a general line of machine tools, including a line of high-grade lathes, a line of high-grade drill presses, punches and shears, bulldozers, cylinder grinders and cylindrical grinding machines, punch presses, a line of cheaper drill presses, and railroad freight car shop equipment. Until recently Mr. McDowell was manager of the machine-tool department at Chicago for the Fairbanks Co. Mr. Burns was also in this department of the Fairbanks Co., and during the war was gage inspector for the Government and was subsequently with the Machine Tool Sales Division of the War Salvage Board. Before going with the Fairbanks Co. Mr. McDowell was identified with McDowell, Stocker & Co., machine-tool merchants, Chicago.

The Chicago Machine-Tool Dealers' Association met at the Machinery Club on June 13 to elect a director to represent that body in the Employers' Association of Chicago.

The McLelland Electric Bake Oven Corporation, 36 South State Street, Chicago, has been incorporated by Charles E. Weadley, Julius Slora and William McLelland with \$100,000 capital stock to manufacture and install electric conveyor ovens and other baking apparatus.

The Carbo-Hydrogen Co., manufacturer of welding and cutting apparatus, 104th Street and Torrence Avenue, Chicago, has secured a building permit for a one-story plant, 55 x 140 ft., to cost \$15,000.

The Ferro Mfg. Co., manufacturer of automobile specialties, 2011 South Michigan Avenue, Chicago, has started the construction of a plant at Belvidere, Ill.

The Absolute Contractor Corporation, 126 Shirland Avenue, South Beloit, Ill., has been incorporated with \$100,000 capital stock to manufacture electrical and mechanical apparatus, accessories and machinery. Louis M. Phelan of Chicago is president.

The Waukegan Foundry Co., Waukegan, Ill., has been incorporated to manufacture gray iron and semi-steel castings. A plant with 10,000 sq. ft. of floor space will be put up just north of the American Steel & Wire Co. works. A. K. Barr, formerly of the Barr Pattern Co., North Chicago, is head of the company, and with him is associated E. T. Skidmore, for the past 15 years connected with the Chicago Hardware Foundry Co., North Chicago, as credit manager.

The Commercial Club of Owatonna, Minn., has pledged the sale of \$50,000 common stock of the American Accumulator Co., recently incorporated in St. Paul. The construction of a plant for the company in Owatonna therefore seems assured. It will manufacture storage batteries.

The Central Foundry Co., Albert Lea, Minn., has purchased the patents and machinery of the Imperial Furnace Co., Marshalltown, Iowa, manufacturer of hot-air furnaces. It will be shipped to Albert Lea and will be installed in the former Sorg Oil Engine Co. plant, which adjoins the property of the Central Foundry Co.

The Owens Motor Sales Co., 713 University Avenue, St. Paul, Minn., will soon let a contract for the erection of a one and two-story garage addition to cost \$80,000.

The Connors Machinery Co., 2640 Shields Avenue, Chicago, has been incorporated with a capital of \$100,000 by Walter T. Fisher, Roy P. Kelly and William C. Boyden, Jr., to manufacture machinery and parts.

The Chicago Engineering Works, Inc., 1916 Sunnyside Avenue, Chicago is taking bids for a new three-story and basement building, 50 x 125 ft., at Lawrence Avenue and Leavitt Street, to cost about \$70,000.

The Normal Apparatus Co., 217-223 West Huron Street, Chicago, has been incorporated with a capital of \$40,000 by Carl F. W. Pfeiffer, Charles J. Deegan and E. Merckle, to manufacture scientific apparatus.

The Western States Portland Cement Co., Independence, Kan., has commenced the erection of its new plant at Davenport, Iowa, estimated to cost about \$2,000,000, with machinery. It is expected to have the new mill ready for service in about 12 months. The plant will include a machine shop, power house and other mechanical departments.

The Exact Machine Works, 917 South Kedzie Avenue, Chicago, has been organized to manufacture tools and machinery. Leo E. Kennedy and William D. LaBatt head the company.

The Public Service Co., 72 West Adams Street, Chicago, an interest of the Commonwealth Edison Co., is considering the erection of a new electric generating plant in the vicinity of Waukegan, Ill., to cost close to \$5,000,000, with machinery. Samuel Insull is president.

The Producers & Refiners Corporation, Denver, Col., has



arranged for a bond issue of \$3,000,000, a portion of which will be expended for plant and pipe line extensions. Plans are under way for the erection of a new skimming plant in the vicinity of Casper, Wyo., to cost about \$400,000. Refinery additions and improvements will also be made.

## Detroit

DETROIT, June 13.

The Street Railway Commission, 320 Murphy Building, Detroit, will soon call for bids for a new one-story car repair and machine works, 250 x 350 ft., at Lillibridge and Warren avenues. W. C. Markham is engineer.

The City Council, Traverse City, Mich., is having plans prepared for a new hydroelectric power plant for municipal service, to cost about \$250,000. Burd & Giffels, Kelsey Building, Grand Rapids, Mich., are engineers. O. C. Mof-fett is city clerk.

The Cook & Willoughby Co., Detroit, has been organized by Ray R. Cook and David J. Willoughby, 925 Stimson Place, to manufacture automobile horns, lamps and kindred products.

The Michigan Agricultural College, Lansing, Mich., has completed plans for a one-story and basement power plant, 50 x 136 ft., to cost about \$150,000. E. A. Dowd, 127 Allegan Street, is architect.

The Superior Brass Works, Inc., Detroit, has been incorporated with a capital of \$40,000 by Carl W. Thurmes, John M. Burke, 262 Chalmers Avenue, Detroit; Frank M. Klump, Bedford, Ohio, to manufacture brass and bronze castings and other metal products.

Cross & Moore, Detroit, care of A. E. Harley, architect, 2631 Woodward Avenue, have taken bids for a two-story, automobile service and repair works, 110 x 125 ft., at Grand River and Arcadia avenues, estimated to cost about \$125,000.

The Chapel Electric Co., Jackson, Mich., has been incorporated with a capital of \$20,000 by Ralph D. Chapel, F. Bling and Charles D. Dixon, Jackson, to manufacture electrical equipment.

The Automatic Oil Indicator Co., 350 Mulberry Street, Newark, has filed notice of organization to manufacture oil indicating apparatus and other automotive equipment. Rodney S. Rose, 112 Chadwick Avenue, heads the company.

Robert H. Lope, Inc., Rutherford, N. J., has been incorporated with a capital of \$50,000 by Robert H. Lope, Neil N. Payne and J. Palmer Collins, 57 Park Avenue, to manufacture tools and other mechanical equipment.

The Five-In-One Auto Signal Co., 298 South Sixth Street, Newark, has filed notice of organization to manufacture automobile signal devices. Louis M. Lombreglio heads the company.

## Cincinnati

CINCINNATI, June 13.

A better feeling exists in the machine-tool field than for some time. Many local manufacturers report much better inquiry, and the prospects for closing some business look a little brighter than for many weeks. The past week a local manufacturer received an order for four geared head lathes and another maker for several shapers and gear cutters. The Louisville & Nashville Railroad and the Hopkings Valley Railroad were both purchasers during the week, each taking a single machine. The Louisville & Nashville has another inquiry out for three motor driven lathes. The Great Northern Railroad is reported to have made some purchases on its list issued several months ago, but definite information is lacking. The Illinois Central and Rock Island are expected to close within the next two weeks. Two local manufacturers of lathes are said to have received substantial inquiries from their representatives in France. The information accompanying the inquiries is that American tools are required, rather than those of British or German manufacture. A number of inquiries are also reported from South America, Cuba and Mexico and some orders are being booked.

The city of Indianapolis has purchased a 20-ton Northern crane. The inquiry from the Norton Iron Works, Ashland, Ky., for two 10-ton traveling cranes is still pending.

Machinery is now being installed in the Cincinnati plant of the American Blower Co., and it is expected that operations in the foundry and fabricating departments will commence in about six weeks. The plant has been completely remodeled.

The Able Magnesia Co., Columbus, Ohio, has purchased the plant and equipment of the Cedarville Lime Co., Cedarville, Ohio, and will shortly commence the erection of a new plant, costing approximately \$300,000, to manufacture steam pipe and boiler coverings and various by-products.

The Alco Foundry & Machine Co., Wellston, Ohio, recently purchased the property of the Hamden Foundry Co.

and is making alterations for the production of gray iron castings. M. C. Able, formerly secretary and treasurer of the Wellston Mfg. Co., heads the new concern.

Reorganization of the Elwood Myers Co., Springfield, Ohio, manufacturers of metal specialties, is in progress. It is capitalized at \$2,500,000. At a recent meeting of the board J. S. Crowell was made president; Scipio E. Baker, vice-president and treasurer, and R. H. Lupfer, secretary.

The Victor Mfg. Co., Springfield, Ohio, manufacturers of tools and metal specialties, has leased a three-story factory building on St. Mary's Street, Dayton, Ohio, and will occupy it in the near future. It is understood that it will be operated in conjunction with the plant in Springfield.

Israel Brothers, Dayton, Ohio, owners of the Israel Brothers Iron & Metal Co. and the Dayton Bronze Bearing Co., have purchased the buildings of the Platt Iron Works, Keowee and Valley streets, Dayton, for approximately \$225,000. It is understood that the Dayton Bronze Bearing Co. will occupy part of the buildings for the manufacture of brass and aluminum castings. Negotiations are under way for leasing part of the property to an Eastern manufacturing concern.

The State Highway Department, 335 South High Street, Columbus, Ohio, is planning the erection of a new one and two-story automobile service building and repair plant, 113 x 386 ft., to cost about \$150,000.

The G. & W. Mfg. Co., Dayton, Ohio, recently incorporated with a capital of \$50,000, is arranging for the operation of a local plant for the manufacture of packing house machinery. Equipment will be purchased at an early date. The company is headed by J. J. Gage, A. J. Welty and L. E. Smith.

The Columbus Forge & Iron Co., West First Avenue, Columbus, Ohio, will take bids at once for two new buildings, one-story, 110 x 120 ft. and 70 x 200 ft., respectively, to cost about \$80,000. Braun, Fleming, Knollman & Prior, 233 South High Street, are architects.

## Philadelphia

PHILADELPHIA, June 13.

The Standard Steel Car Co., Pittsburgh, has acquired the Vim Motor Truck Co., Broad and Huntingdon streets, Philadelphia, manufacturer of automobile trucks, as a subsidiary organization. It is now giving employment to about 300 operatives, with production at considerably reduced capacity, averaging about 14 trucks per day. The Standard company also operates the Middletown Car Co. and the Baltimore Car & Foundry Co.

The American Fork & Hoe Co., Ashland & Lewis streets, Philadelphia, has awarded a contract to the Rice-Jones Co., 10600 Euclid Avenue, Cleveland, for extensions and improvements in its plant to cost about \$10,000.

The Manufacturers' Japanning & Enameling Co., Philadelphia, has been organized to manufacture japanned metal goods, etc. L. F. Ward, 132 North Eighteenth Street, heads the company.

The O'Brien Machinery Co., Philadelphia, is taking bids up to June 30 for an addition to its building at 119 North Third Street, including improvements in the present structure.

The Pennsylvania Pressed Steel Corporation, Philadelphia, has been incorporated with a capital of \$5,000,000 to manufacture steel and iron products. It is represented by Wray C. Arnold, Commonwealth Building.

The Asbestos Corporation, Philadelphia, recently organized with a capital of \$250,000, has perfected plans for the establishment of works at Belfield Avenue and Fisher's Lane, for the manufacture of automobile brake linings and similar products. Machinery will be installed at once. William G. Kitchen is president and treasurer and John F. Bolger is vice-president and general manager.

The Philadelphia Paper Mfg. Co., River Road, Philadelphia, manufacturer of boxboard specialties, has filed plans for a new two-story reinforced-concrete building, 100 x 180 ft., to cost about \$200,000.

The Equipment Corporation of America, Land Title Building, Philadelphia, with plant at Thirty-first and Walnut streets, has acquired about eight and one-half acres of land with a number of buildings at Primos, near Philadelphia. The structures will be remodeled and improved, and the Philadelphia works removed to the new location at an early date.

The General Refractories Co., Philadelphia, has been organized to manufacture fire brick, furnace linings and other refractory products. John R. Sproul, Chester, Pa., son of Governor Sproul of Pennsylvania, heads the company.

The Bresswell Co., Philadelphia, has been organized by H. T. Bressler, 1129 South Forty-sixth Street, and associates, to manufacture machinery and parts.

The Axilrod Power Transmission Co., Philadelphia, has been incorporated with a capital of \$280,000 to manufacture power transmission machinery, gearing, etc. F. R. Hansell, Land Title Building, represents the company.

The John A. Roebling's Sons Co., Trenton, N. J., has plans under way for a new building, 500 x 850 ft., on Lalor Street, for the copper wire and electrical galvanizing departments, estimated to cost about \$150,000. Following the election of Col. Washington A. Roebling as president of the company, to succeed the late Karl G. Roebling, it is said that plans are being arranged for enlargements in a number of departments. The rolling mill will resume operations at once, following a shut-down of a number of weeks. This department gives employment to about 150 operatives.

The Levelgraf Co. of America, Trenton, N. J., has been incorporated with a capital of \$1,000,000 by Joseph J. Felcone, Carl F. Adams and Frederic R. Brace, 137 East State Street, to manufacture scientific instruments, measuring apparatus and other precision equipment.

Charles W. Stone, 1109 South Broad Street, Trenton, N. J., machinist, is planning the organization of a company for the establishment of a factory to manufacture a sectional radiator for automobile service, and a special cooling system and apparatus for house service, both of which he has invented.

The Lizard Creek Foundry Co., Lehigh, Pa., has been incorporated with a capital of \$50,000, to manufacture iron and steel castings. C. W. Bower, Lehigh, is treasurer.

A. J. List, Tyrone, Pa., operating an automobile service works, has awarded a contract to John Hildebrand, Tyrone, for the erection of a new two-story service and repair building on Tenth Street, 60 x 100 ft., to cost about \$50,000.

## The Central South

St. Louis, June 13.

Bernard E. Mohr, who on April 1 resumed the business of dealing in machine tools at 5407 East Avenue, St. Louis, after a year with the Fairbanks Co., has taken out incorporation papers as the Bernard E. Mohr Machinery Co., with \$10,000 capital stock, fully paid.

Frank E. Stevens, owner of the Carondelet Motor Co., St. Louis, heads the National Compressor Co., a new corporation with \$15,000 capital stock, to manufacture compressors. No further details are available now.

The Wrought Iron Range Co., 5661 Natural Bridge Avenue, St. Louis, has awarded contract to the Murch Brothers Construction Co., Railway Exchange Building, to erect a one and two-story addition to its stove factory, 221 x 146 ft., to cost \$75,000.

The Duplex Tire & Rubber Co., R. W. Crissey, president, New Gates Hotel, Joplin, Mo., has commissioned the Osborn Engineering Co., 2848 Prospect Street, Cleveland, to prepare plans for its new automobile tire manufacturing plant, to be three stories, 100 x 300 ft., and estimated to cost about \$150,000.

The Usona Mfg. Co., 826 South Eighteenth Street, St. Louis, manufacturer of electrical equipment, will take bids until June 23 for a new one and two-story factory on Chateau Street, 100 x 150 ft., and estimated to cost about \$75,000 with equipment. F. C. Long is president and O. J. Popp, Odd Fellows Building, architect.

The Henry L. Koehler Mfg. Co., Twelfth and Rowan streets, Louisville, manufacturer of stencils and other metal specialties, is planning to rebuild the portion of its factory destroyed by fire June 1, with loss estimated at about \$100,000.

The Odell Rubber Co., South Bend, Ind., recently organized with a capital of \$50,000, is considering the erection of a new plant at Paducah, Ky., for the manufacture of automobile tires and tubes.

The Western Tie & Timber Co., 915 Olive Street, St. Louis, has commenced the construction of its proposed new hydro-electric power plant on Jack's Fork, near Eminence, Mo., estimated to cost in excess of \$400,000.

The Kansas City Wire & Iron Works, Kansas City, Mo., is planning to rebuild its machine and repair shops, recently destroyed by fire, with loss of about \$80,000, including equipment.

The Agrimotor Mfg. Co., Wichita, Kan., manufacturer of farm tractors, road-building machinery, etc., has plans under way for a new two-story plant at Ninth and Illinois streets, Joplin, Mo., to cost about \$100,000, with machinery. C. W. Lewis is president.

The Silver Lake Mining Co., Seligman, Mo., is planning for the erection of a new power house at its properties. It will also install considerable new mining machinery. T. R. Gilliam, vice-president, is in charge.

The Producers' Cold Storage Co., Medill, Mo., will build a new three-story cold storage plant, 53 x 108 ft., to cost about \$60,000.

The Common Council, Jasper, Mo., is arranging for a bond issue of \$40,000 for the construction of a municipal power plant. A. C. Moore, Independence Building, Joplin, Mo., is engineer.

The Rowan County Freestone Co., Farmers, Ky., is planning to rebuild its stone crushing plant, recently destroyed by fire, with loss of about \$50,000. The work will include new rock crushing and sorting machinery, and power house for operation. H. Van Antwerp is president and manager.

The Rose City Petroleum Co., 407 Donaghey Building, Little Rock, Ark., will expend about \$25,000 for machinery for installation at its local oil refinery. It is proposed to develop the plant to a daily maximum output of 1000 bbl. of oil per day. E. B. Fowler is secretary and treasurer.

The Corning Ice Co., Corning, Ark., is planning the erection of a series of new cold storage and ice plants at Knobel, Success and Peach Orchard, Ark. Work will commence at an early date.

The Massey-Harris Co., Toledo, Ohio, has preliminary plans under way for the erection of a new hardwood lumber-working plant at Pine Bluff, Ark., estimated to cost in excess of \$200,000, with wood-working machinery.

The Union Saw Mill Co., Huttig, Ark., is considering the rebuilding of its mill, destroyed by fire May 31, with loss reported at \$1,000,000, including machinery. It is a subsidiary of the Frost-Johnston Lumber Co., New Orleans.

The Silica Products Co., Guion, Ark., is perfecting plans for the erection of new works for the production of glass sand, with initial daily capacity of about 200 tons. The installation will comprise a set of rolls, elevating and conveying equipment, rotary dryer and power plant.

Freight handling equipment will be installed on the new wharf to be constructed by the Common Council, Helena, Ark., on the waterfront. Extensive shipping and railroad facilities will be provided.

## Cleveland

CLEVELAND, June 13.

There is more inquiry for single machines than last month, but orders show no improvement. Prospective buyers in many cases are deferring purchases until business picks up, or for other reasons. One price change is reported, namely, a reduction of 10 per cent by the Seneca Falls Mfg. Co., Seneca Falls, N. Y., on its line of lathes.

Building contractors who specialize in manufacturing plants report an improved volume of inquiry for factory buildings, the industries showing the most activity being paper mills and furniture manufacturers.

The H. K. Ferguson Co., Cleveland, has taken a contract from the B. L. Marble Chair Co., Bedford, Ohio, for a three-story and basement mill type building, 80 x 300 ft., for the manufacture of hardwood office chairs. This is the first of two units to be erected. It will also build a new power plant shortly. The building and equipment will cost approximately \$400,000. The Ferguson company has also recently taken a contract from the Gibson-Snow Co., Inc., Albany, N. Y., manufacturing chemists, for a four-story and basement factory building, 38 x 106 ft., brick and mill construction. It is at present erecting nine industrial buildings, contracts for which have been taken this year.

The F. E. Myers & Brothers Co., Ashland, Ohio, has been incorporated to take over the manufacturing business heretofore conducted by the partnership of F. E. Myers & Brothers, manufacturers of pumps. It will have an authorized capital of \$6,000,000, of which \$2,000,000 is preferred and \$4,000,000 common stock. The officers are: F. E. Myers, president; P. A. Myers, first vice-president and general manager; John C. Myers, second vice-president; Guy C. Myers, third vice-president, and F. B. Kellogg, secretary and treasurer.

The Universal Machine Co., Bowling Green, Ohio, is planning to add to its present line of products the manufacture of roller bearings, and will increase its capitalization by the issue of \$300,000 in preferred stock.

The Ladel Mfg. Co., New Philadelphia, Ohio, has placed a contract for the erection of a steel and brick machine shop and foundry, 88 x 307 ft.

The plant of the Heltzel Steel Form & Iron Works, Warren, Ohio, manufacturer of steel forms for concrete work, was recently destroyed by fire.

The Grant Quick Ice Machine Co., Barberton, Ohio, has been organized with a capital stock of \$25,000 for the manufacture of ice machines.

The Department of Public Service, Martins Ferry, Ohio, has preliminary plans under way for a new municipal electric generating plant, estimated to cost about \$500,000. John Haid is director of the department.



## Pittsburgh

PITTSBURGH, June 13.

The machine tool market in this section is more nearly at a standstill than it has been at any time since the recession in general business set in last fall. Not only are current sales few and small, but there are few promising projects before the trade. One local dealer reports having taken an order amounting to about \$4,000 for tools for a machine shop in process of formation in Johnstown, Pa., including a grinder, drill press and a threading machine, all motor-driven, and some miscellaneous tools. This is about the only business recently done where more than one tool was involved. Equipment for the new crusher plant of the Kelley Island Lime & Transportation Co., Marblehead, Ohio, includes a couple of cranes and there is a fair chance that this business may be placed in a few weeks. The tendency to defer placing orders against crane inquiries which have been out for some time still is pronounced. Neither the motors nor mill drives for the new plant of the International Nickel Co., Huntington, W. Va., have been placed, but an award of the motors is looked for in a few days and the drives are expected to be placed late this week.

The Board of Education, Knox, Pa., is arranging for the installation of manual training equipment at the local vocational school.

The Oltean Delea Triple Safety Lock Mfg. Co., Elwood City, Pa., has been organized to manufacture locks and special locking devices. Jeremiah Delea, Elwood City, is treasurer.

The Dolls Run Coal Co., 479 McLane Avenue, Morgantown, W. Va., is planning for the installation of new hoisting, conveying and general operating equipment at its properties. It was recently incorporated. David S. Brewer is president and general manager.

The Davis-Wolfe Oil Co., Box 611, Parkersburg, W. Va., is planning for the installation of new oil drilling machinery and other operating equipment at its properties. It was recently organized with a capital of \$100,000. Robert E. Davis is head.

The Model Electric Mfg. Co., Pittsburgh, has been incorporated with a capital of \$25,000 to manufacture electrical equipment. T. H. Heuber, 1104 Bushton Avenue, is treasurer.

The Point Spring Co., Pittsburgh, is being organized by D. T. Gleason, H. D. Walker and F. G. Darlington, Jr., to manufacture steel springs and other iron and steel products. It is represented by W. Heber Dithrich, 618 Frick Building. Application for a State charter will be made on July 5.

The Elwood Foundry & Machine Co., Elwood City, Pa., has been incorporated with a capital of \$75,000 to manufacture machinery, iron and steel castings, etc. C. W. Carbeau, Zelinople, Pa., is treasurer.

## Baltimore

BALTIMORE, June 13.

The Jerry Brothers Co., 1823 East Main Street, Richmond, Va., manufacturer of belting, is having revised plans prepared for its new plant, three stories, 25 x 130 ft. Leonard C. and Bernard L. Jerry head the company.

The American Color Process Press Co., Morrison, Del., has been incorporated with a capital of \$100,000 by L. Irving Handy, Smyrna, Del.; Julian C. Walker and M. K. Spicher, Richardson Park, Del., to manufacture printing presses and parts.

Stockholders of the Aetna Explosives Co., Inc., New York, have ratified the proposed merger with the Hercules Powder Co., Wilmington, Del., and the latter organization will assume control at once. By the purchase the Hercules company will acquire high explosive manufacturing plants at Birmingham; Ishpeming, Mich.; Fayville, Ill.; and Emporium and Sinnamahoning, Pa.; black blasting powder plants at Birmingham, and Goes Station, Ohio; blasting cap manufacturing plant at Port Ewen, N. Y., and a similar works in the vicinity of Prescott, Ont.

The Metropolitan Garage Co., 1319 L Street, N. W., Washington, is completing plans for a new automobile service and repair building to cost about \$225,000 with equipment. The Milburn Heisler Co., 710 Fourteenth Street, N. W., is architect.

The Southern Ice Machine Mfg. Co., Charlotte, N. C., has completed plans for a new one-story factory, 50 x 140 ft., for the manufacture of ice and refrigerating machinery. Frank Owens is president.

The City Council, Charleston, S. C., is arranging for the purchase of waterfront property for municipal service. Freight and warehouse buildings will be erected, to be equipped with traveling cranes, and other hoisting and conveying machinery. John P. Grace, mayor, is interested in the project.

Electric motors, conveyor systems, transmission equipment and other mechanical apparatus will be installed in the new plant to be erected by the Old Dominion Beverage Corporation, 202 Lyric Building, Richmond, Va., to be 82 x 125 ft., reinforced-concrete, and estimated to cost \$175,000. W. C. Saunders is president.

The National Radiator Co., 15 East Fayette Street, Baltimore, has plans under way for a new building on Frisby Street, fronting on the line of the Baltimore & Ohio Railroad, 80 x 170 ft. Charles A. Frank is local manager.

The Navy Department, Bureau of Yards and Docks, Washington, is considering the construction of a new drydock, with shipyard buildings, at the Navy Yard, Charleston, S. C.

The Black & Decker Mfg. Co., Baltimore, manufacturer of portable electric drills, electric valve grinders and electric air compressors, announces a guarantee of its present prices until Jan. 1, 1922.

Plans are being made by the Star Motor Co., Frederick, Md., to enlarge its machine shop.

The Iron City Stove Co., Bristol, Va., contemplates enlarging its plant. E. H. Wilkinson is president.

The Elkins Furniture Co., Henderson, N. C., will rebuild its plant recently destroyed by fire and desires prices on wood-working machinery. R. L. Hubbard is secretary.

## Milwaukee

MILWAUKEE, June 13.

The machine tool trade is just about holding its own, the past week or 10 days having developed further small orders which enable makers to maintain production at the same small rate of recent weeks. This is regarded as encouraging in view of the general stagnation of the metal-working industries. Orders continue to be for single tools for quick shipment. The only substantial prospect for new business during the summer is the requirements which railroads are expected to place.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad Co. has plans for improvements in Wisconsin involving an investment of \$7,500,000 to \$10,000,000, according to a statement by C. E. Urbahns, general superintendent Wisconsin division, with headquarters at Minneapolis. The lines from Junction City to Stockton, via Stevens Point, and from Spencer to Marshfield, Wis., will be double-tracked. Division repair shops will be remodeled and enlarged, with some retooling. It is stated that steel for the new tracks has been purchased and delivered.

The Oshkosh Tractor Co., Oshkosh, Wis., a new corporation with a capital stock of \$1,500,000 preferred and 15,000 shares of common stock without par value, has engaged Auler & Jensen, local architects, to prepare plans for a one-story brick, concrete and steel machine shop and assembling floor, 150 x 500 ft., to cost about \$175,000. It is taking over the entire business of the LaCrosse Tractor Co., LaCrosse, Wis., and it is hoped to effect the transfer by Sept. 1. A. D. Paine, 22 East New York Avenue, Oshkosh, is representing local interests.

The Wee Jack Co., Tomahawk, Wis., has been organized with a capital stock of \$25,000 to manufacture lifting jacks and other metal specialties and automotive equipment, designed and patented by O. G. Wee, president of the company. E. H. Welfley is vice-president, and Arthur D. Oelhafen, secretary and treasurer. It is planned to lease quarters for machine shop and assembling processes until such time as business warrants the erection of a new plant.

The Jorgenson Mfg. Co., Waupaca, Wis., manufacturer of priming devices and other automotive equipment, brass castings, etc., has intermitted operations for about three weeks, during which time the plant will be overhauled, retooled and equipment rearranged in preparation for an increased production. The foundry is being continued in operation to provide a supply of brass castings when the machine shop is reopened about July 1.

The Fond du Lac Welding & Cutting Co., Fond du Lac, Wis., has been organized by Edward Patt and Gustave Stasewick to establish a general machine and repair shop in the Huber Building, Marquette and McWilliams streets. The owners also are proprietors of the Sheboygan, Wis., Welding & Cutting Co. Both shops specialize in welding cast iron, aluminum, brass, steel, etc.

The Perco Ware Co., Milwaukee, has been incorporated with a capital stock of \$50,000 to manufacture a general line of cooking utensils. The signers of the articles are H. E. Toelle, H. W. Schuler and Benjamin Pomm, attorneys, 120 Wisconsin Street. Details of the enterprise will be given out later.

The Hutter-Shutter Co., Stevens Point, Wis., has been granted a charter to manufacture metal shutters for automobile radiators and a general line of metal automotive

specialties. The initial capital is nominal. A. D. Hutter, L. F. Hutter and H. M. Hutter are the principals.

The Parker Pen Co., Janesville, Wis., manufacturer of fountain pens, has purchased a major interest in the American metals Co., Attleboro, Mass., which manufactures metal pens and pencils. On Jan. 1, 1922, the plant and equipment will be moved from Attleboro to Janesville, where the Parker company has recently completed a new factory representing an investment of more than \$300,000. The American Metals Co. is a \$100,000 corporation now in production in leased quarters at Attleboro. The consolidation of operations will enable the Parker company to engage in quantity production of gold pens for its fountain pen production, it having heretofore purchased this part in the market. George S. Parker is president and general manager.

The National Traffic Sign Co., Morrisonville, Wis., has been incorporated with a capital stock of \$15,000 to manufacture cast iron traffic posts, poles and similar metal specialties. The incorporators are T. H. Mair, Simon Furness, Benj. Furness and W. L. Richards.

The Brunett Perfect Heating System, Inc., Rice Lake, Wis., which was organized some time ago with an authorized capitalization of \$1,250,000, is preparing to build the first unit of its plant, which will cost about \$75,000. It manufactures heating systems for rural and suburban communities.

The John Broenen Co., 402-410 Madison Street, Milwaukee, will build a two-story addition, 50 x 75 ft., costing about \$20,000. It manufactures carriages and vehicles and builds special motor car bodies, truck bodies, cabs, etc., and does repair and replacement work on motor vehicles. The general contractor is Robert L. Reisinger Co., 464 Oakland Avenue, Milwaukee.

Geisinger Brothers, Park Falls, Wis., are breaking ground for a new public garage and machine shop, 50 x 76 ft., two stories and part basement, of which an area of 50 x 50 ft. will be equipped for general machine and repair work. It will cost about \$25,000. R. A. Messmer & Brother, Majestic Building, Milwaukee, are architects.

## Indiana

INDIANAPOLIS, June 13.

The Visible Pump Mfg. Co., Fort Wayne, Ind., will soon take bids for the erection of a two-story and basement plant, 80 x 80 ft., for the manufacture of gasoline pumps, estimated to cost about \$60,000.

The Economy Tool Co., Warsaw, Ind., has been incorporated with a capital of \$150,000 by A. T. Anderson, A. C. McDonald and C. O. Dickey, Warsaw, to manufacture tools, machine parts, etc.

The Universal Device Co., Valparaiso, Ind., recently organized with a capital of \$50,000, will begin production at once, in a building recently acquired, for the manufacture of gasoline measuring and registering devices, known as gasometers. F. H. Farrell is one of the heads of the company.

The International India Rubber Corporation, 310 West Ewing Avenue, South Bend, Ind., has construction under way on a two-story and basement plant, on East Ewing Avenue, to cost about \$30,000.

The Standard Oil Co. of Indiana, Indianapolis, has arranged for an increase in capital from \$100,000,000 to \$140,000,000, a portion of the proceeds to be used for extensions in refineries.

The El-Air-O Heat Co., Greencastle, Ind., has been incorporated with a capital of \$25,000 by B. B. M. I. G. O. and S. A. D. Stringer, Greencastle, to manufacture heating apparatus.

## California

LOS ANGELES, June 7.

The Fresno Tire & Rubber Co., Fresno, Cal., has awarded a contract to the Unit Construction Co., Phelan Building, San Francisco, for a new three-story plant at Tehama and Belmont avenues, to cost about \$100,000, with machinery.

The Pacific Can Machine Co., Los Angeles, has been incorporated with a capital of \$150,000 by Samuel B. Irvin, I. B. Stetson and J. E. McComas to manufacture can-making machinery. The company is represented by Miller & McComas, Los Angeles.

The Continental Can Co., 616 West Forty-third Street, New York, has taken title to about 15 acres on Fifty-fourth Avenue, Oakland, Cal., which will be used for the erection of a new plant, estimated to cost close to \$1,000,000.

The Coast Welding & Blacksmith Co., 527 West Seventh Street, San Pedro, Los Angeles, has filed plans for a new machine shop, 26 x 50 ft.

The Illinois Pacific Glass Co., Fifteenth and Folsom streets, San Francisco, is negotiating with the Chamber of Commerce, San Mateo, Cal., for a site for the erection of a new plant. It is said that the initial investment will approximate \$1,000,000, including a number of units and machinery.

The Hartmeyer Improved Curtain Rod Mfg. Co., Los Angeles, has been incorporated with a capital of \$30,000 by A. W. and N. M. Hartmeyer to manufacture special metal curtain rods and other kindred equipment. J. E. McComas, 421 Laughlin Building, represents the company.

The Board of Education, Berkeley, Cal., has completed plans for a new electric power plant at the local high school.

The California Fibre Co., San Francisco, has acquired property on San Pablo Avenue, Berkeley, Cal., which will be remodeled for a new fibre manufacturing plant. Machinery, including special equipment, will be installed at an early date.

The Stamp Electric Hoist Co., San Francisco, has been incorporated with a capital of \$75,000 by William T. Burney, C. S. Somers and Horace W. Lash, Monadnock Building, to manufacture electrically-operated hoisting machinery.

The Bay Point Cutting & Welding Co., Richmond, Cal., recently organized, has temporary works on Division Street and will specialize in heavy casting work. A large plant will be established at a later date. A. C. Arthur is president.

## The Gulf States

BIRMINGHAM, June 13.

The Jahncke Dry Dock & Ship Repair Co., New Orleans, has acquired the Crescent Machine & Mfg. Co. and the Stern Foundry & Machine Co. and will remove the machinery at the two plants to its main works. P. A. Debus, formerly of the Crescent organization, will be general manager at the Jahncke plant.

C. Halper & Sons, Dallas, Tex., have completed plans for a new automobile service and repair works, 85 x 150 ft., on Young Street, to cost about \$60,000.

The Schwing Lumber & Shingle Co., Plaquemine, La., is perfecting plans for rebuilding its mill, recently destroyed by fire, with loss of about \$85,000, including machinery.

The American Fruit Growers' Association, Orlando, Fla., has acquired property at Lakeland, Fla., fronting on the line of the Atlantic Coast Railway, and has plans under way for a new ice-manufacturing plant, to cost about \$300,000, with machinery. It recently completed the construction of a plant at Haines City, Fla.

The J. B. Nelson Quarry Co., Houston, Tex., has acquired granite and marble properties at Llano, Tex., and plans the installation of quarrying works. The machinery, with power house, is estimated to cost in excess of \$200,000.

The Common Council, Edinburg, Tex., is arranging for a bond issue of \$100,000, for the installation of a municipal electric lighting plant.

The Weatherford Water, Light & Ice Co., Weatherford, Tex., is planning for extensions in its electric power plant to double the present capacity.

L. B. Boyd, Miami, Fla., is establishing a plant, 50 x 60 ft., for the manufacture of cement blocks.

Additional machinery will be installed by the Miami Electric Light & Power Co., Miami, Fla. H. H. Hyman is manager.

The Atlas Machine & Foundry Co., Birmingham, will build a one-story machine shop to cost about \$10,000.

## Seattle

SEATTLE, June 7.

Some good machinery prospects have been developing in the domestic trade, but frequently these are transferred to the second-hand market and jobbers in new goods, who spend time quoting, find they have innocently been aiding dealers in used materials to good cash sales. This situation explains in a great measure the light volume of new machinery sold in this section the past few months.

Jobbers of machinery and machine tools, plates and sheets complained the past winter of the policy used during the war in permitting heavy stocks to accumulate, and at that time it was forecast that the effect of these old stocks would be felt for several months.

Jobbers declare that second-hand lathes, drills, drill presses and other machinery are constantly being listed by brokers who have bought the shipyard accumulations. At times it was felt that these stocks were cleaned up, but with varying frequency new lists are issued and the effect on new business is demoralizing. Spokane manufacturers who bought heavy duty machinery during the war and had



been successful bidders on contracts, are now sending price lists to the Coast with a desire to unload as quickly as possible.

The export situation is reported better. Representatives of Seattle houses, situated in the Orient, have been here the past week for consultation and review of the outlook with the home offices and are preparing at once to return. The feeling has undoubtedly improved, especially in Japan, which is manifesting the greatest interest in machinery and machine tools. Manila receded from its position as a buyer last spring, due to the falling exchange, but dealers are hopeful that they will be able to close on several good-sized pending contracts before the midsummer.

## Canada

TORONTO, June 13.

The machine-tool business shows but slight improvement. Dealers, however, appear more optimistic than for some time past, chiefly on account of the increased number of inquiries. Announcements have recently been received that buying interests in China and India are making inquiries in the Canadian market, which may ultimately turn into some good business. The demand for wood-working equipment and small tools is holding the chief interest in the local market, and used equipment is also moving in a quiet but steady way.

Shayne & Jaffe Co., Ltd., Montreal, are in the market for transformers, 200 k.v.a., 550 to 2200 volts, 60 cycle; 550 to 2200 or 48,000 volts, 30 cycle; motors, 60 cycle, 550 volts, also 25 and 30 cycle, 2200 volts; air compressor, belt driven, about 1000 cu. ft. per min.; corrugated galvanized iron, 36 x 96 in. (one carload); jaw crusher, head, 36 x 40.

W. T. Rawleigh, 55 Liberty Street, Freeport, Ill., will erect a six-story factory on Adelaide Street, London, Ont., 75 x 200 ft., to cost \$150,000. G. W. Corbett, Adelaide Street, London, is manager.

Black, Fasken & Hennessey, will erect a ground wood pulp mill on Dixon Creek, New Liskeard, Ont., to cost \$500,000. A. Fasken, Excelsior Life Building, Toronto, is interested.

H. Pelandean, Ltd., 1211 Ontario Street, Montreal, is in the market for complete planing mill equipment.

The Fireproof Crushed Stone Co., Ltd., 2650 Masson Street, Montreal, is in the market for crushing plant equipment.

The Northwest Side Oil Co., Montreal, W. H. Butler, president Canadian Car & Foundry Co., Montreal, interested, desires Keystone drills and other well-drilling equipment.

The London Motors, Ltd., London, Ont., W. Stansell, president, is asking for equipment for an automobile plant it proposes to erect.

M. Roberts, 570 Dorchester Street, Montreal, is in the market for lathe and general garage repair equipment.

W. Mahoney, 162 Anger Street, Montreal, is in the market for two lathes and other machine-shop equipment.

## Industrial Finances

The capital stock of the Daniel Russell Boiler Works, Inc., Boston, has been increased from \$10,000 to \$100,000 to cover an excess of company assets. John J. Regan is president and Daniel Russell, treasurer.

The Greenfield Machine Co., Greenfield, Mass., has declared a stock dividend in the ratio of 2 1/4 shares of new stock for each share held and has increased its capital stock from \$60,000 to \$195,000 to offset surplus assets. Edward F. Smith is president and Joseph G. Stevens, treasurer.

The James Russell Boiler Works Co., Boston, has increased its capitalization from \$10,000 to \$60,000 and has issued the new stock against excess assets.

Sales billed by the Allis-Chalmers Mfg. Co. in the quarter, ended March 31 last, were \$7,656,218, contrasted with \$6,320,597 in 1920 and \$8,602,892 in 1919. The net profits after federal taxes for the quarter were \$774,189, equal, after all other charges and preferred dividends, to \$1.87 a share on the outstanding common stock. For the like period in 1920 the net earnings were \$767,214, or \$1.84 per share on the common stock. Unfilled orders on books as of May 1 amounted to \$12,600,000, as against \$17,500,000 at the close of 1920.

The report of the International Nickel Co. for the year ended March 31 shows a surplus, after charges and taxes, amounting to \$2,029,700, which, after deducting preferred dividends, is equal to 89c. a share on the outstanding common stock. In the previous year the company showed a surplus of \$2,745,734, or \$1.32 a share. At the close of the fiscal year the company's plants were running 20 per cent of capacity.

## IRON AND INDUSTRIAL STOCKS

### Depression in the Steel Industry Has Had More Influence of Late

The depression in the steel industry the past week appears to have had more influence on holders of securities than heretofore. Until recently, steel securities held remarkably steady, but since last reports they have led the continued general liquidation, which carried numerous stock values into new low ground for 1921. In fact, steel securities, generally speaking, have declined out of proportion to working capitals and equities. Fear that such corporations cannot continue to earn and pay dividends has driven investors to sell out and to reinvest in Government securities. Talk of lower steel prices and the fact the United States Steel Corporation, as of May 31, last, had less unfilled business on its books than it has had before in more than two years have not helped the market for steel and allied issues. The impression also is gaining ground that shut-downs will be more common during the next month or two, and that consumption of iron and steel will be comparatively small as a result.

In addition, uneasiness is felt regarding possible railroad labor troubles, which explains at least part of recent selling of securities. Cheaper money has had little, if any, influence on public sentiment, while renewed weakness in foreign exchange rates, due in a measure to operations in connection with German reparation payments, has. Dividend omissions in several lines of industry continue for the purpose of conserving cash reserves. The general attitude still leans toward the pessimistic rather than the constructive side. It is believed, however, strong interests are picking up stocks at current rates with a view to ultimate consolidations of industries.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com.	32	- 31 1/2	Midvale Stl.	23 1/2	- 25 1/2
Allis-Chalm. pf.	70 1/2	- 73 1/2	Nat.-Acme	18 1/2	- 20
Am. Can. com.	27 1/2	- 30 1/2	Nat. E. & S. com.	50 1/2	- 52 1/2
Am. Can. pf.	80	- 82 1/2	N. Y. Air Brake	56	- 61 1/2
Am. C. & F. com.	122 1/2	- 125 1/2	Nova Scotia Stl.	20 1/2	- 29
Am. Loco. com.	81	- 84 1/2	Pressed Stl. com.	76	- 80 1/2
Am. Loco. pf.	102 1/2	- 104 1/2	Pressed Stl. pf.	87	- 87 1/2
Am. Radiator com.	69 1/2	- 70	Ry. Stl. Spg. com.	80 1/2	- 83 1/2
Am. Stl. F. com.	27 1/2	- 29 1/2	Ry. Stl. Spg. pf.	101	- 101 1/2
Bald. Loco. com.	75 1/2	- 79 1/2	Republic Steel	22 1/2	- 25 1/2
Bald. Loco. pf.	99	- 99 1/2	Republic com.	48 1/2	- 55
Beth. Stl. com.	50 1/2	- 52 1/2	Republic pf.	85	- 88
Beth. Stl. Cl. B.	51 1/2	- 56 1/2	Sloss, com.	35 1/2	- 38 1/2
Beth. Stl. 8% pf.	99 1/2	- 100 1/2	Sloss, pf.	70	- 70
Chi. Pneu. Tool.	55	- 60	Superior Steel	29	- 36
Colo. Fuel	27	- 28 1/2	Super. Stl. 1st pf.	94	- 97
Cruc. Steel com.	57 1/2	- 66	Transue-Williams	35	- 36
Cruc. Steel pf.	83 1/2	- 83 1/2	Un. Alloy Steel	19	- 25
Gen. Electric	126	- 134 1/2	U. S. Pipe com.	13	- 15
Gt. N. Ore Cert.	27 1/2	- 27 1/2	U. S. Steel com.	76 1/2	- 80
Gulf States Stl.	30 1/2	- 33 1/2	U. S. Steel pf.	106 1/2	- 108 1/2
Int. Har. com.	84 1/2	- 88	Vanadium Steel	27 1/2	- 29 1/2
Int. Har. pf.	103 1/2	- 103 1/2	Va. I. C. & Coke	78	- 80 1/2
Lackawanna Stl.	40	- 45 1/2	Westingh'se Elec.	44 1/2	- 46

The Bickett Machine & Mfg. Co., Cincinnati, manufacturer of planers and special machinery, has been placed in the hands of a receiver, as a result of the suit filed by Charles A. Bickett, president of the company.

The By-Products Coke Corporation, 332 South Michigan Avenue, Chicago, has arranged for a bond issue of \$4,000,000 for general operations, financing, etc. H. H. S. Handy is president.

A petition in bankruptcy has been filed against the Lauraine Magneto Co., Ely Avenue, Long Island City, N. Y.

Charles B. Evans and former United States Senator Willard Saulsbury have been appointed temporary receivers of Pusey & Jones, Inc., Wilmington, Del., operating a local shipyard, with branch yards at Gloucester City, N. J.

Application has been made to the Secretary of State of Ohio by the Youngstown Iron & Steel Co., subsidiary of the Sharon Steel Hoop Co., to reduce its capitalization from \$3,000,000 to \$10,000. The Sharon company owns all of the capital stock of the Youngstown Iron & Steel Co. and maintenance of a high capitalization involving considerable taxation thereon is unnecessary.

The Northern Conveyor & Mfg. Co., Milwaukee, which recently completed and placed in operation a new plant at 3204-3210 Auer Avenue, has increased its capital stock from \$25,000 to \$100,000.

The H. & H. Machine Co., St. Louis, automobile machine, cylinder grinding and repairing, has increased its capital stock from \$15,000 to \$36,000, the added capital being paid in from accumulated surplus.

# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

## Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined bars, base price.....	3.23c.
Swedish bars, base price.....	12.00c.
Soft steel bars, base price.....	3.23c.
Hoops, base price.....	4.15c. to 4.28c.
Bands, base price.....	3.88c.
Beams and channels, angles and tees	
3 in. x ¼ in. and larger, base.....	3.23c. to 3.33c.
Channels, angles and tees under 3 in. x	
¼ in., base.....	3.23c.

## Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.23c.
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.43c.
Toe calk, ½ x ¾ in. and larger.....	3.75c.
Cold-rolled strip, soft and quarter hard.....	10.00c. to 10.50c.
Open-hearth spring steel.....	4.50c. to 8.00c.
Shafting and Screw Stock:	
Rounds.....	4.73c.
Squares, flats and hex.....	5.23c.
Standard cast steel, base price.....	14.00c.
Extra cast steel.....	17.00c.
Special cast steel.....	22.00c.

## Tank Plates—Steel

¼ in. and heavier.....	3.23c. to 3.33c.
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## Sheets

### Blue Annealed

	Per Lb.
No. 10.....	4.23c. to 4.25c.
No. 12.....	4.28c. to 4.30c.
No. 14.....	4.33c. to 4.35c.
No. 16.....	4.44c. to 4.45c.

### Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20.....	4.95c. to 5.18c.	.....
Nos. 22 and 24.....	5.00c. to 5.23c.	5.60c.
No. 26.....	5.05c. to 5.28c.	5.65c.
No. 28.....	5.15c. to 5.38c.	5.75c.
No. 30.....	5.40c. to 5.63c.	.....

No. 28, 36 in. wide, 10c. higher.

### Galvanized

	Per Lb.
No. 14.....	4.75c. to 5.38c.
No. 16.....	5.00c. to 5.63c.
Nos. 18 and 20.....	5.15c. to 5.78c.
Nos. 22 and 24.....	5.30c. to 5.93c.
No. 26.....	5.45c. to 6.08c.
No. 27.....	5.60c. to 6.23c.
No. 28.....	5.75c. to 6.38c.
No. 30.....	6.25c. to 6.88c.

No. 28, 36 in. wide, 20c. higher.

## Welded Pipe

### Standard Steel

	Blk.	Galv.		Blk.	Galv.
½ in. Butt....	—46	—30	¾ in. Butt....	—18	List
¾ in. Butt....	—52	—37	1-1½ in. Butt....	—20	— 2
1-3 in. Butt....	—54	—40	2 in. Lap....	—14	+ 3
3½-6 in. Lap....	—49	—35	2½-6 in. Lap....	—18	— 2
7-12 in. Lap....	—40	—24	7-12 in. Lap....	— 7	+10

### Wrought Iron

## Steel Wire

BASED PRICE\* ON NO. 9 GAGE AND COARSER

	Per Lb.
Bright basic.....	4.50c.
Annealed soft.....	4.50c.
Galvanized annealed.....	5.25c.
Coppered basic.....	5.00c.
Tinned soft Bessemer.....	6.50c.

\*Regular extras for lighter gages.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

## Brass Sheet, Rod, Tube and Wire

### BASE PRICE

High brass sheet.....	16 c. to 19¼c.
High brass wire.....	17¼c. to 21¼c.
Brass rod.....	15 c. to 20¼c.
Brass tube, brazed.....	29½c. to 31½c.
Brass tube, seamless.....	19½c. to 21½c.
Copper tube, seamless.....	22½c. to 23½c.

## Copper Sheets

Sheet copper, hot rolled, 24 oz., 22c. to 24c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

## Tin Plates

### Bright Tin

Grade	Grade
"AAA"	"A"
Charcoal	Charcoal
14x20	14x20
IC..\$11.10	\$10.00
IX.. 12.30	11.25
IXX.. 14.10	12.75
IXXX.. 16.10	14.75
IXXXX.. 17.70	16.50

### Coke—14x20

	Primes	Wasters
80 lb....	\$7.30	\$7.05
90 lb....	7.40	7.15
100 lb....	7.50	7.25
IC....	7.70	7.45
IX....	8.60	8.35
IXX....	9.60	9.35
IXXX....	11.00	10.75
IXXXX....	12.00	11.75

## Terne Plates

8-lb. Coating 14 x 20

100 lb. ....	\$8.00
IC .....	8.25
IX .....	8.50
Fire door stock .....	11.50

## Tin

Straits pig .....	33c.
Bar .....	38c. to 40c.

## Copper

Lake ingot .....	16c.
Electrolytic .....	16c.
Casting .....	16c.

## Spelter and Sheet Zinc

Western spelter .....	6½c. to 6¾c.
Sheet zinc, No. 9 base, casks.....	11½c. open 12c.

## Lead and Solder\*

American pig lead .....	5¾c.
Bar lead .....	6¼c. to 6¾c.
Solder, ½ and ½ guaranteed.....	24¼c.
No. 1 solder .....	21½c.
Refined solder .....	18½c.

\*Prices of solder indicated by private brand vary according to composition.

## Babbitt Metal

Best grade, per lb.....	80c.
Commercial grade, per lb.....	40c.
Grade D, per lb.....	35c.

## Antimony

Asiatic .....	6½c. to 7c.
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## Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb....	30c. to 33c.
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## Old Metals

Business has been very quiet this week and values are slightly off. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	10.50
Copper, heavy and wire.....	9.75
Copper, light and bottoms.....	8.00
Brass, heavy.....	5.75
Brass, light .....	4.50
Heavy machine composition .....	9.25
No. 1 yellow brass turnings .....	5.00
No. 1 red brass or composition turnings.....	7.25
Lead, heavy .....	3.75
Lead, tea .....	2.75
Zinc .....	3.00



